FINAL ENVIRONMENTAL IMPACT STATEMENT

FOR THE

Copenhagen Wind Farm

Town of Denmark, Lewis County and
Towns of Champion and Rutland
Jefferson County, New York

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Date Submitted to Lead Agency: July 1, 2014

Date Accepted by Lead Agency: July 10, 2014

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COMMONLY USED ACRONYMS AND ABBREVIATIONS

amsl	above mean sea level
BBA	Breeding Bird Atlas (New York State)
BMP	Best Management Practice
dBA	decibels, A-rated
DEIS	Draft Environmental Impact Statement
EAF	Environmental Assessment Form
EDR	Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C.
EPA	Environmental Protection Agency
ESA	Endangered Species Act of 1973
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
GIS	geographic information system
ISCP	Invasive Species Control Plan
kV	kilovolt
kW	kilowatt
MW	megawatt
MWh	megawatt-hours
NYISO	New York Independent Service Operator
NYCRR	Official Compilation of Codes, Rules, and Regulations of the State of New York
NYS	New York State
NYSA&M	New York State Department of Agriculture & Markets
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSERDA	New York State Energy Research and Development Authority
O&M	Operations and Maintenance
OPRHP	New York State Office of Parks, Recreation, and Historic Preservation
PILOT	payment in lieu of tax
POI	Point of Interconnection
PSC	New York State Public Service Commission
SEQRA	State Environmental Quality Review Act
SHPO	New York State Historic Preservation Office

SPCC	Spill Prevention, Control, and Countermeasure
SPDES	State Pollutant Discharge Elimination System
SWPPP	Stormwater Pollution Prevention Plan
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOE	U.S. Department of Energy
USFWS	U.S. Fish & Wildlife Service
USGS	U.S. Geological Survey
VIA	Visual Impact Assessment
WNS	White-Nose Syndrome

1.0 INTRODUCTION

This Final Environmental Impact Statement (FEIS) is prepared for the Copenhagen Wind Farm (hereafter, "the Project") pursuant to the New York State Environmental Quality Review Act (SEQRA) and its implementing regulations, 6 NYCRR Part 617. This document is preceded by a Draft Environmental Impact Statement (DEIS). The FEIS builds upon the DEIS, providing extensive responses to substantive comments received on the DEIS, and addressing Project changes that occurred after the DEIS was accepted as complete, including changes in response to public and agency input. The DEIS is incorporated by reference into this FEIS, and remains in full effect except where specifically corrected or the Project has been changed. The FEIS thus provides a comprehensive analysis of the potential environmental impacts of the Project, where applicable, to identify reasonable alternatives or mitigation measures to reduce the effect of those impacts to the maximum extent practicable, while weighing the social and economic considerations of the Project. However, this FEIS does not, in general, reiterate information that remains accurate and unchanged from the DEIS.

1.1 SUMMARY OF SEQRA PROCESS

On May 5, 2012 an application for special use permit and a full Environmental Assessment Form (EAF) for the proposed Project was submitted by the Copenhagen Wind Farm, LLC (hereafter, Project Sponsor) to the Town of Denmark Planning Board. The submittal of this application, which requires discretionary approval, initiated the SEQRA process for the subject action. On July 7, 2012, the Town of Denmark Planning Board forwarded a solicitation of Lead Agency status, along with a copy of the EAF document, to potentially interested/involved SEQRA agencies. It was stated in the letter of intent to act as lead agency that, subject to the agreement of all Involved Agencies, the lead agency determination would become effective 30 days from the date of the declaration letter. No agency objected to the Town of Denmark Planning Board assuming the role of Lead Agency. The Town of Denmark, as Lead Agency, subsequently issued a Positive Declaration on August 7, 2012 requiring the preparation of a DEIS. The DEIS was accepted as complete on June 4, 2013, and copies of the DEIS were subsequently delivered to involved/interested agencies, and posted to a website managed by Own Energy (www.ownenergy.net/project-development/copenhagen-wind-farm). Opportunities for detailed agency and public review were provided during the DEIS public comment period (June 4, 2013 through August 13, 2013), including a public hearing conducted by the Lead Agency on July 9, 2013, at the Copenhagen Central School gymnasium (3020 Mechanic Street, Copenhagen, NY). A responsiveness summary has been prepared as part of this FEIS (Section 4.0) to address all substantive comments received on the DEIS during the public comment period.

The following represent the next steps in the SEQRA process for the Project, starting with issuance of this FEIS by the Lead Agency:

- FEIS issued by Lead Agency (Town of Denmark Planning Board).
- Final notice of completion of FEIS published in the NY DEC Environmental Notice Bulletin.
- Distribute FEIS and a copy of the public notice to the agencies listed in Table 3 of the DEIS.
- 10-day minimum period before issuing findings.
- Lead Agency issues Findings Statement, completing the SEQRA process.
- Involved agencies issue Findings Statements and make their permit decisions.

1.2 SUMMARY OF THE DEIS

At the time the DEIS was prepared, the Project was proposed to consist of 62 wind turbines, among which 49 sites were to be selected for turbine construction and operation. The Project was also proposed to include the construction of associated components including three permanent meteorological towers, a system of gravel access roads, buried 34.5 kilovolt (kV) electrical collector lines, an operation and maintenance (O&M) building, and a collection and transforming station. To deliver power to the New York State power grid, the Project Sponsor also proposed to construct a 115 kV overhead transmission line (approximately 9 miles in length), and a Point of Interconnection (POI) facility located adjacent to the existing National Grid East Watertown substation in Watertown, NY. The wind turbine proposed was the GE 1.6 – 100, and the Project was estimated to deliver up to 79.9 MW of electrical power into the New York State grid upon operation. The Project was proposed to be developed on approximately 9,700 acres of leased land, or land that was subject to lease negotiations at the time of the DEIS. Construction was anticipated to commence in the late spring of 2014 and to finish by December 31 of that year. The Project was anticipated to employ approximately 7 to 10 operations and maintenance personnel.

Various plans and support studies were prepared and included in the DEIS, which provided detailed information on discrete topical areas in furtherance of the SEQRA evaluation. These studies included the following:

- Wetland and Ecological Inventory Report (DEIS Appendix F)
- Preliminary Stormwater Pollution Prevention Plan (SWPPP) (DEIS Appendix D)
- Phase 1A Cultural Resources Investigation (DEIS Appendix L)
- Visual Impact Assessment (DEIS Appendix J)
- Shadow Flicker Analysis (DEIS Appendix K)
- Traffic and Transportation Study (Appendix N)
- AM and FM Broadcast Analysis (Appendix O)
- Cellular/PCS Telephone Analysis (Appendix O)
- Off-Air Television Reception Analysis (Appendix O)

- Licensed Microwave Search & Worst Case Fresnel Zone Study (Appendix O)
- Land Mobile Radio Analysis (Appendix O)
- Sound Level Assessment Report (Appendix M)

In addition to providing a Project description (Section 2.0) and summary of the purpose, need, and benefit of the proposed Project (Section 2.2), the DEIS also presented a summary of the required approvals and regulatory process (Section 2.9), a discussion of potential environmental impacts and proposed mitigation measures (Section 3.0), unavoidable adverse impacts (Section 4.0), Project alternatives (Section 5.0), commitment of resources (Section 6.0), growth inducing impacts (Section 7.0), cumulative impacts (Section 8.0), and Project effects on the use and conservation of energy resources (Section 9.0). See the DEIS for a full discussion of these topics. A summary of the potential impacts and mitigation presented in the DEIS are given below.

1.2.1 Summary of Potential Impacts

In accordance with requirements of the SEQRA process, potential impacts arising from the proposed action were identified early in the application process and were evaluated in the DEIS with respect to an array of environmental and cultural resources. The potential impacts identified in the DEIS are summarized in Table 1 below:

Table 1. Summary of Potential Impacts Identified in the DEIS

Environmental Factor	Potential Impacts
Physiography, Geology, and Soils	Soil disturbance Soil erosion Soil compaction Loss of agricultural land
Water Resources	Temporary disturbance Siltation/sedimentation Stream crossings Alteration of private water supplies
Biological Resources	Vegetation clearing/disturbance Incidental wildlife injury and mortality Loss or alteration of habitat
Climate and Air Quality	Construction vehicle emissions Dust during construction Reduced air pollutants and greenhouse gases
Aesthetic/Visual Resources	Visual change to the landscape Visual impact on sensitive sites/viewers Shadow-flicker impact on adjacent residents
Cultural Resources	Visual impacts on architectural resources Disturbance of archaeological resources

Environmental Factor	Potential Impacts
Sound	Construction noise Operational impacts on adjacent residents Low frequency noise
Transportation	Road wear/damage Traffic congestion/delays Road system improvements/upgrades
Socioeconomic	Host communities to receive a payment in lieu of taxes (PILOT) Revenue to participating landowners Expenditures on goods and services Tourism Short-term and long-term employment
Public Safety	Construction concerns related to large equipment, falling objects, open excavations, electrocution Possible ice shedding concerns Project components catching fire Low frequency noise
Communication Facilities	Temporary interference to communication signals Degraded reception to off-air television signals
Community Facilities and Services	Demands on police and emergency services Relocated utility distribution lines and poles
Land Use and Zoning	Adverse and beneficial impacts on forested land Changes in community character and land use trends

The Executive Summary of the DEIS summarizes anticipated Project impacts in the following way:

> *"Construction of the Project will result in disturbance of up to 372 acres of soil and 590 acres of vegetation, most of which is forest land or active agriculture. In addition, approximately 14 acres of wetland could be disturbed by Project construction. However, the majority of these impacts will be temporary and will require U.S. Army Corp of Engineers approval. A total of 58 acres will be converted to built facilities, including 17 acres of forest land and 0.5 acre of wetland. Project construction will also result in some level of temporary disturbance and congestion on area roadways. The impacts are anticipated to be less than described above because only 49 of the 62 turbines will be constructed.*
>
> *Project operation is expected to result in some level of avian and bat collision mortality. The turbines will be visible from many locations within the surrounding area, particularly in agricultural areas with wide open fields, but will also be fully or partially screened from viewers in many locations (e.g., in forested areas, developed settings and in parts of the valleys surrounding the Project area). Only very minor changes in land use within the Project area are anticipated as a result of Project implementation. The Project is expected to generate approximately $624,000 per year (15.5 million over 20 years) in PILOT revenues to local taxing jurisdictions, while requiring very little in terms of municipal services."*

1.2.2 Summary of Potential Mitigation

The DEIS proposes various measures that will be taken to avoid, minimize and/or mitigate potential environmental impacts. General mitigation measures include adhering to requirements of various local, state, and federal ordinances and regulations and entering into development agreements with adjacent landowners. The Project Sponsor will also employ Environmental Monitors to assure compliance with permit requirements and environmental protection commitments during construction. The proposed Project will result in significant environmental and economic benefits to the area. These benefits also serve to mitigate unavoidable adverse impacts associated with Project construction and operation.

The DEIS addresses the following specific measures designed to mitigate or avoid adverse potential environmental impacts during Project construction or operation:

- Siting the Project away from population centers and areas of substantial residential development.
- Siting turbines and access roads so as to avoid or minimize impacts to wetlands and streams.
- Using the routing of existing logging roads and farm lanes for turbine access whenever possible to minimize disturbance to forest and agricultural land.
- Utilizing 'best practice' construction techniques that minimize disturbance to vegetation, streams, and wetlands.
- Implementing agricultural protection measures to avoid, minimize, or mitigate impacts on agricultural land and farm operations.
- Limiting turbine lighting to the minimum allowed by the Federal Aviation Administration (FAA) to reduce nighttime visual impacts, and following lighting guidelines to reduce the potential for bird collisions.
- Entering into a PILOT agreement with the local taxing jurisdictions to provide a significant predictable level of funding for the town, county, and school districts for the operational life of the Project.
- Close coordination with local first responders and other relevant community support service.

2.0 REVISIONS TO THE DEIS

The FEIS builds upon the DEIS, providing additional information and addressing Project changes that occurred after the DEIS was accepted as complete and released for public comment.

2.1 CHANGES TO THE PROJECT LAYOUT

Since the time that the DEIS was released, some adjustments to the Project layout have occurred. As indicated in the DEIS, 62 turbine locations were presented, among which 49 sites were to be selected for turbine construction and operation. Consistent with the DEIS, the Project has been reduced. Specifically, the 62 proposed turbine locations have been reduced to 47 sites, and the size and capacity of turbines has been modified slightly. The make and model of the turbine proposed in the DEIS was the GE 1.6 - 100 wind turbine currently with a rated capacity of 1.62 MW, and a diameter of 100 meters (328 feet), mounted on a 96-meter (315-foot) tubular steel tower (total height 150 meters (492 feet). The currently proposed turbine make and model is the GE 1.7 – 100 wind turbine, with a rated capacity of 1.7 MW and the same blade and tower dimensions.

The length of the 115 kV overhead transmission line has also been reduced, as the POI substation is now proposed to be located adjacent to the National Grid Black River – Lighthouse Hill 115kV transmission line in the Town of Rutland, instead of adjacent to the National Grid East Watertown substation in Watertown, NY. Therefore, no Project components are now proposed to be located in the Town of Watertown.

In addition, adjustments have been made to the locations of access roads, electrical collection lines, collection and transforming stations, O&M facility location, and the temporary laydown yard location. These modifications were incorporated as a result of detailed on-site engineering analyses, landowner negotiations and requests, efforts to avoid or minimize impacts to water resources, and suggestions made by the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Agriculture & Markets (NYSA&M). The NYSDEC and NYSA&M suggested changes were reviewed by Project engineers and the Project Sponsor, and those changes that were deemed feasible from an engineering perspective have been incorporated into the layout, and have further reduced impacts to forestland, water resources, and agricultural land.

The proposed location and spacing of the wind turbines and support facilities is based on multiple years of wind resource assessment, site-specific ecological investigations, constructability review and engineering design, and adherence to the zoning and setback requirements set forth in the Towns of Denmark, Champion, and Rutland.

The adjustments to the Project layout are listed below and displayed in Figure 1, which compares the DEIS layout to the current Project layout (i.e., FEIS Layout). Further, all DEIS figures that displayed the Project layout or Project site have been revised to reflect the modifications discussed below, and are attached to this FEIS (Figures 2 - 10).

- Turbines 7, 16-17, 21-22, 28-30, 45, 58-63 (15 turbines total) have been removed from the Project. These turbines were removed due to engineering considerations, shifting landowner participation, and wind resource optimization.
- Twenty-seven (27) turbine locations have been shifted/refined for various reasons including constructability/engineering analyses, Town setback requirements, NYSA&M guidelines, Fresnel zone avoidance, wetland impact avoidance, landowner preference, and to accommodate a shift of an adjacent turbine. Specifically, the following turbine location refinements are incorporated into this FEIS:
    - Turbine 1 shifted 3,650 feet to the northwest, near the former location of Turbine 21 (which has been removed from the Project)
    - Turbine 4 shifted 244 feet to the southwest
    - Turbine 5 shifted 584 feet to the southwest
    - Turbine 6 shifted 116 feet to the southwest
    - Turbine 8 shifted 567 feet to the northwest
    - Turbine 9 shifted 209 feet to the northwest
    - Turbine 10 shifted 180 feet to the east
    - Turbine 12 shifted 336 feet to the southwest
    - Turbine 18 shifted 315 feet to the northwest
    - Turbine 19 shifted 205 feet to the northwest
    - Turbine 20 shifted 116 feet to the north
    - Turbine 25 shifted 66 feet to the south
    - Turbine 26 shifted 55 feet to the south
    - Turbine 33 shifted 72 feet to the southwest
    - Turbine 35 shifted 401 feet to the southeast
    - Turbine 36 shifted 218 feet to the southeast
    - Turbine 39 shifted 83 feet to the southeast
    - Turbine 40 shifted 124 feet to the southwest
    - Turbine 47 shifted 266 feet to the west
    - Turbine 48 shifted 321 feet to the east
    - Turbine 50 shifted 313 feet to the southwest
    - Turbine 51 shifted 488 feet to the southwest

- Turbine 52 shifted 498 feet to the southwest
- Turbine 53 shifted 445 feet to the west
- Turbine 54 shifted 313 feet to the northwest
- Turbine 56 shifted 49 feet to the east
- Turbine 57 shifted 126 feet to the northeast

- The access roads providing access to the turbines listed above, along with the buried collection system, have been shifted accordingly and in a manner which has not resulted in increased impacts to wetlands, streams, agricultural land, or other sensitive resources. In some cases, access roads have also been shifted to coincide with landowner preferences.

- One additional short span of overhead electrical interconnect line has been added to the Project layout. The additional span will cross a steep ravine and associated stream (Stony Creek), and will be located between turbines 51 and 52 (south of Halifax Road). This short section of overhead line will eliminate the impacts to an ecologically sensitive resource (Stony Creek) and address on-site constructability constraints. The span will also greatly reduce the amount of forest clearing, erosion and sedimentation, and wetland impacts that would otherwise occur if an overhead span of Stony Creek was not utilized.

With these Project adjustments incorporated, the Project area now totals approximately 9,200 acres, and the Project consists of 47 wind turbines, approximately 15.2 miles of access roads, 20.3 miles of 34.5 kV electrical collector lines, a collection substation, 8.8 miles of overhead 115 kV electric transmission line, a POI substation, three meteorological towers, a construction staging area, and an Operations and Maintenance (O&M) facility. FEIS Figure 3 depicts the current location of all Project components, including wind turbines and transmission lines. In addition, a large-scale (poster size) version of this map is included as Appendix O.

As described in the DEIS, these Project components and their construction will result in disturbance to soil and vegetation and changes to land use. Conservative assumptions associated with the Project's limits of disturbance are outlined in Table 2, which illustrates that most impact assumptions have remained unchanged since the DEIS. The few changes to the impact assumptions are associated with the electrical collection and transmission lines, and are emphasized below in Table 2. These changes are a result of advancements in Project design/engineering.

Table 2. Areas of Disturbance for Construction

Project Components			Typical Area of Vegetation Clearing	Area of Total Soil Disturbance (temporary and permanent)	Area of Permanent Soil Disturbance
Wind Turbines and Workspaces		DEIS	Up to 200' radius per turbine	Up to 200' radius per turbine	0.20 acres per turbine (pedestal & crane pad)
		FEIS			
Access Roads		DEIS	100' wide per linear foot of road	40' wide per linear foot of road	20' wide per linear foot of road
		FEIS			
*	Buried Electrical Gathering Lines	DEIS	25' wide per linear foot of line	25' wide per linear foot of line	None
		FEIS	50' wide per linear foot of line	50' wide per linear foot of line	
*	Overhead Electrical Gathering Lines	DEIS	N/A	N/A	N/A
		FEIS	50' wide per linear foot of line	1,600 square feet per pole	16.6 square feet per pole
*	Transmission Line	DEIS	100' wide per linear foot of line	20' wide per linear foot of line	None, other than pole bases
		FEIS	100' wide per linear foot of line	1,600 square feet per pole	16.6 square feet per pole
*	Transmission Line Access Roads	DEIS	N/A	N/A	N/A
		FEIS	20' wide per linear foot of road	16' wide per linear foot of road	N/A
Meteorological Towers		DEIS	1 acre per tower	1 acre per tower	0.10 acre per tower
		FEIS			
O&M Building and associated site (7,000 sf)		DEIS	3.5 acres	3.5 acres	2.5 acres
		FEIS			
Staging Area		DEIS	8 acres (if required)	8 acres (if required)	None
		FEIS			
Collection Station		DEIS	2 acres	2 acres	1.5 acres
		FEIS			
Substation		DEIS	1 acre	1 acre	0.35 acre
		FEIS			

The changes to the Project layout have had an effect on anticipated impacts related to soils, vegetation, and land use, as summarized below in Table 3. These changes are further described in the following sections. The impact

acreages listed in Table 3 under the heading "FEIS" are the currently anticipated impacts (calculated based in the FEIS impact assumptions outlined in Table 2), and supersede those reported in the DEIS.

Table 3. Comparison of Impact Acreages Between DEIS and FEIS

Resource	Total Disturbance (Acres)		Converted to Built Facilities (Acres)		Temporary Disturbance (Acres)	
	DEIS	FEIS	DEIS	FEIS	DEIS	FEIS
Soils						
Total Disturbance to Soils	372	352.5	58	45	314	307.5
Vegetative Communities						
Forest	192	131.4[1]	17.0	9.9	175	121.5
Successional Old Field	36	37.9	5.0	2.2	31	35.7
Successional Shrubland	67	58.5	4.0	2.7	63	55.8
Agricultural Land	290.5	319.7	31.0	29.6	259.5	290.1
Disturbed/Developed	3.5	2.9	0.5	0.6	3.0	2.3
Total Disturbance to Vegetation	589	550.5	57.5	45.0	531.5	505.5
Land Use						
Agriculture	480.0	456.5	46.0	36.9	434.0	419.6
Residential	65.5	60.4	7.5	4.9	58.0	55.5
Vacant Land	42.0	32.8	4.0	3.2	38.0	29.6
Public Services	1.5	0.0	0.5	0.0	1.0	0.0
Conservation Easement	0.0	0.8	0.0	0.0	0.0	0.8
Total Disturbance to Land Uses	781.5	550.5	75.5	45.0	706	505.5

[1] Of the 131.4 acres of impacted forestland, 9.9 acres will be converted to built facilities, 76.6 acres will be maintained as successional shrubland or old field communities for the life of the Project, and 44.9 acres will be allowed to regenerate naturally upon completion of construction activities. However, because of the long-term affect such disturbance will have on forested communities (i.e., the forests will not fully regenerate during the life of the Project), the entire 121.5 acres of "temporary" forest impact can be considered forest conversion impacts.

As shown in Table 3, anticipated impact acreages have been reduced significantly from what was presented in the DEIS. This is primarily the result of the reduced number of turbines proposed (and associated components such as access roads and buried collector lines) and shortening the length of the overhead transmission line.

2.2 ADDITIONAL INFORMATION

This section provides an overview of additional information that will further enable the Lead Agency to make the necessary findings under SEQRA.

2.2.1 Geology, Soils, and Topography

2.2.1.1 Existing Conditions

As described in Section 2.1, the Project layout has changed since the release of the DEIS. With these Project adjustments incorporated, the Project area now totals 9,200 acres. This Section has been updated to reflect the changes in Project area and Project layout.

2.2.1.1.1 Topography

Topography is generally as reported in Section 3.1.1.1 of the DEIS. Elevations in the generating portion of the revised Project area range from approximately 940 feet above mean sea level (amsl) at the Deer River crossing of the collection line, to approximately 1,490 feet amsl off County Route 194 in the southwestern portion of the generating site. Elevations at turbine sites range from approximately 1,185 feet amsl to approximately 1,440 feet. No turbines are proposed in the valley portions of the Project area.

2.2.1.1.2 Geology

Bedrock and surficial geological material within the Project area are as described in Section 3.1.1.2 of the DEIS.

2.2.1.1.3 Soils

The Lewis and Jefferson County soil surveys indicate that 12 soil associations and 107 soil map units from 51 different soil series are present within the revised Project area (see Figure 4). Of these, Nellis is still by far the most dominant soil series, covering over approximately 3,108 acres or 34 percent of the current Project area. And as in the DEIS, other prominent soil series (each covering greater than 500 acres within the current Project area) still include Amenia, Galway, Kendaia, and Poland. Characteristics of the soil associations and dominant soil series found within the Project area remain as described in Section 3.1.1.3 of the DEIS.

Soil drainage within the current Project area is still predominantly well drained, with approximately 50 percent of the on-site soils well drained, 20 percent excessively to somewhat excessively drained, 6 percent moderately well drained, and 24 percent somewhat poorly drained to very poorly drained (USDA, 1960; USDA, 1989). Soils that are listed as hydric by the NRCS cover approximately 27 percent of the current Project area. Prominent hydric soils each covering over 150 acres include Kendaia silt loam (map unit KbA), Galway silt loam (map unit GIA), Bombay loam (map unit BoB), Turin silt loam (map unit TbB), Ilion silt loam (map unit IaA), and Newstead silt loam (map unit Nn). The percentage of the current Project area containing soils classified as either prime farmland soils or farmland of statewide importance remains at approximately 78 percent.

Suitability for shallow excavations, shrink/swell potential, potential incidence of landslides, and overall erosion hazard are as reported in Section 3.1.1.3 of the DEIS. Areas of moderate erosion hazard occur in small patches throughout the Project area, primarily associated with slopes in excess of 15 percent. This is limited to several small areas along the transmission line corridor; the location of Turbines 50 and 53 and associated infrastructure; several small sections of access roads (approaching Turbines 36 through 38, between Turbines 50 and 6, and approaching Turbines 53 and 54); and several small sections of interconnect (between Turbines 42 and 46, between Turbines 2 and 15, between Turbines 31 and 54, and between Turbines 51 and 52).

2.2.1.2 Potential Impacts

As described in Section 3.1.2, impacts to topography and geology have been largely avoided by siting Project components so as to minimize disturbances to steep slopes, sensitive soils, and bedrock to the extent practical. The primary impact to the physical features of the site will be temporary disturbance of soils during the construction of Project components, including the turbines, construction staging area, O&M building, access roads, underground collector systems, overhead collection and transmission poles, permanent meteorological towers, collection substation, and interconnection substation. The location of each Project component is depicted on FEIS Figure 4.

Earth moving and general soil disturbance will create opportunities for wind/water erosion and sedimentation into surface waters, particularly in areas with moderate to severe erosion hazards. The assumptions outlined in DEIS Section 2.6 and Table 1 (Area of Disturbance for Construction) have been reviewed and updated in FEIS Table 2, as needed. For example, to more accurately address potential impacts associated with the co-location of multiple collection line circuits (see Figure 11), the assumption used to calculate impacts from buried electrical collection lines has been increased, from the 25-foot wide corridor of soil and vegetation disturbance per linear foot of collection line used in the DEIS to a 50-foot wide corridor used in the FEIS. In addition, the FEIS impact calculations incorporate new assumptions for the permanent impact (16.6 square feet per pole) and temporary impact (1,600 square feet per pole) associated with construction of the transmission line and two small segments of overhead collection line. As shown in FEIS Table 2, which was utilized to calculate the impacts presented throughout this FEIS, all other impact assumptions presented in the DEIS remain accurate. Soil disturbance from all anticipated construction activities will total approximately 352.5 acres. Approximately 307.5 acres of this disturbance will be temporary, while 45 acres will be converted to built facilities. Impacts to soils by soil series and drainage class are presented below in Table 4.

Table 4. Soil Impacts by Series and Drainage Class

Soil Series	Soil Series Name	Drainage Class[1]	Temporary Impacts (acres)	Permanent Impact (acres)	Total Impact (acres)
FaA	Fonda silt loam, 0 to 3 percent slopes	VPD	0.5	0.0	0.5

Soil Series	Soil Series Name	Drainage Class[1]	Temporary Impacts (acres)	Permanent Impact (acres)	Total Impact (acres)
GrA	Granby fine sandy loam, 0 to 2 percent slopes	VPD	0.1	0.0	0.1
LcA	Lyons silt loam, 0 to 3 percent slopes	VPD	0.3	0.1	0.3
Pa	Palms muck	VPD	0.1	0.0	0.1
Total Impacts to Very Poorly Drained Soils			0.9	0.1	1.0
AmB	Amenia loam, 3 to 8 percent slopes	PD	0.5	0.0	0.5
Fu	Fluvaquents-Udifluvents complex, frequently flooded	PD	0.4	0.0	0.4
IaA	Ilion silt loam, 0 to 3 percent slopes	PD	4.5	0.6	5.2
IaB	Ilion silt loam, 3 to 8 percent slopes	PD	3.5	0.0	3.5
MaA	Madalin silt loam, 0 to 2 percent slopes	PD	1.1	0.0	1.1
MeA	Marcy silt loam, 0 to 3 percent slopes	PD	1.8	0.1	1.9
MeB	Marcy silt loam, 3 to 8 percent slopes	PD	1.1	0.1	1.2
Total Impacts to Poorly Drained Soils			12.9	0.8	13.7
CaB	Camroden silt loam, 3 to 8 percent slopes	SPD	4.0	0.3	4.3
HeA	Houseville silt loam, neutral, 0 to 3 percent slopes	SPD	1.2	0.2	1.3
KbA	Kendaia silt loam, 0 to 3 percent slopes	SPD	8.0	2.9	10.9
KbB	Kendaia silt loam, 3 to 8 percent slopes	SPD	0.3	0.1	0.4
KcA	Kendaia silt loam, shallow, 0 to 3 percent slopes, loamy	SPD	10.4	1.6	12.0
KcB	Kendaia silt loam, shallow, 3 to 8 percent slopes, loamy	SPD	0.1	0.0	0.1
MoA	Massena silt loam, 0 to 3 percent slopes	SPD	0.2	0.0	0.2
Nn	Newstead silt loam	SPD	1.8	0.0	1.8
TbA	Turin silt loam, 0 to 3 percent slopes	SPD	3.2	0.3	3.5
TbB	Turin silt loam, 3 to 8 percent slopes	SPD	8.5	0.7	9.3
Total Impacts to Somewhat Poorly Drained Soils			37.7	6.1	43.8
AgA	Amenia loam, deep, 0 to 3 percent slopes	MWD	5.9	0.9	6.8
AgB	Amenia loam, deep, 3 to 8 percent slopes	MWD	1.4	1.8	3.2
AmA	Amenia loam, 0 to 3 percent slopes	MWD	0.6	0.0	0.6
BoA	Bombay loam, 0 to 3 percent slopes	MWD	0.2	0.0	0.2
BoB	Bombay loam, 3 to 8 percent slopes	MWD	0.4	0.0	0.4
GcB	Galen fine sandy loam, 0 to 6 percent slopes	MWD	0.4	0.0	0.4
Total Impacts to Moderately Well Drained Soils			8.9	2.7	11.6
AfA	Amenia loam, moderately deep, , 0 to 3 percent slopes	WD	10.1	2.2	12.3
AfB	Amenia loam, moderately deep, 3 to 8 percent slopes	WD	10.4	1.7	12.1
BnA	Blasdell channery silt loam, 0 to 3 percent slopes	WD	0.1	0.0	0.1
FaB	Farmington loam, 0 to 8 percent slopes	WD	1.2	0.0	1.2
GlA	Galway silt loam, 0 to 3 percent slopes	WD	0.4	0.0	0.4
GlB	Galway silt loam, 3 to 8 percent slopes	WD	3.9	0.0	3.9
HbB	Herkimer silt loam, 3 to 8 percent slopes	WD	0.6	0.0	0.6
HbD	Herkimer silt loam, 15 to 25 percent slopes	WD	0.1	0.0	0.1
LoA	Lowville silt loam, 0 to 3 percent slopes	WD	0.3	0.0	0.3

Soil Series	Soil Series Name	Drainage Class[1]	Temporary Impacts (acres)	Permanent Impact (acres)	Total Impact (acres)
LoB	Lowville silt loam, 3 to 8 percent slopes	WD	0.9	0.0	0.9
LoC	Lowville silt loam, 8 to 15 percent slopes	WD	0.6	0.0	0.7
LoD	Lowville silt loam, 15 to 25 percent slopes	WD	0.1	0.0	0.1
MdB	Madrid sandy loam, 3 to 8 percent slopes	WD	6.1	0.9	7.0
MdC	Madrid sandy loam, 8 to 15 percent slopes	WD	1.3	0.2	1.5
MdD	Madrid sandy loam, 15 to 25 percent slopes	WD	0.7	0.0	0.7
MgB	Mohawk silt loam, 2 to 8 percent slopes	WD	3.1	0.5	3.7
MgC	Mohawk silt loam, 8 to 15 percent slopes	WD	0.3	0.0	0.3
MnB	Manlius channery silt loam, 3 to 8 percent slopes	WD	0.4	0.0	0.4
NcB	Nellis loam, moderately deep, 2 to 8 percent slopes	WD	40.0	6.0	46.0
NcC	Nellis loam, moderately deep, 8 to 15 percent slopes	WD	0.3	0.0	0.3
NeB	Nellis loam, deep, 2 to 8 percent slopes	WD	22.8	4.8	27.6
NeC	Nellis loam, deep, 8 to 15 percent slopes	WD	2.1	0.0	2.1
NlB	Nellis loam, 3 to 8 percent slopes	WD	1.4	0.4	1.8
NlC	Nellis loam, 8 to 15 percent slopes	WD	1.1	0.0	1.1
NlD	Nellis loam, 15 to 25 percent slopes	WD	0.7	0.0	0.7
NmE	Nellis and Madrid soils, steep	WD	0.1	0.0	0.1
PeB	Pinckney silt loam, 3 to 8 percent slopes	WD	6.6	1.6	8.2
PeC	Pinckney silt loam, 8 to 15 percent slopes	WD	4.8	0.9	5.7
PfE	Pinckney silt loam, 15 to 35 percent slopes, eroded	WD	0.1	0.0	0.1
PhB	Poland silt loam, 3 to 8 percent slopes	WD	17.9	3.0	20.9
PhC	Poland silt loam, 8 to 15 percent slopes	WD	1.7	0.5	2.2
Total Impacts to Well Drained Soils			140.7	22.7	163.5
AeB	Amenia loam, shallow, 2 to 8 percent slopes	SED	7.0	1.2	8.2
BgB	Benson-Galoo complex, very rocky, 0 to 8 percent slopes	SED	1.4	0.0	1.4
NaC	Nassau channery silt loam, 8 to 15 percent slopes	SED	0.7	0.0	0.7
NbB	Nellis loam, shallow, 0 to 8 percent slopes	SED	79.9	8.3	88.2
NbC	Nellis loam, shallow, 8 to 15 percent slopes	SED	5.1	0.9	6.0
NbD	Nellis loam, shallow, 15 to 25 percent slopes	SED	4.6	1.2	5.9
NfC	Nellis loam, ledgy, 3 to 15 percent slopes	SED	0.2	0.0	0.2
NfD	Nellis loam, ledgy, 15 to 35 percent slopes	SED	6.1	0.9	7.0
Ub	Udorthents, smoothed	SED	0.7	0.0	0.7
Total Impacts to Somewhat Excessively Drained and Soils			105.7	12.6	118.3
PcB	Petoskey fine sandy loam, 3 to 8 percent slopes	ED	0.6	0.0	0.6
Total Impacts to Excessively Drained Soils			0.6	0.0	0.6
Total Impacts to All Soils			307.5	45.0	352.5

[1] Drainage Class Codes: VPD = Very Poorly Drained, PD = Poorly Drained, SPD = Somewhat Poorly Drained, MWD = Moderately Well Drained, WD = Well Drained, SED = Somewhat Excessively Drained, ED = Excessively Drained.

As indicated in the DEIS, Project components have been sited to minimize temporary and permanent impacts to soils, including agricultural resources, to the extent practical. However, construction activity has the potential to impact sensitive soils through rutting, mixing of topsoil and subsoil, soil compaction, and erosion. Impacts to agricultural soils, hydric soils, and steep slopes are summarized below in Table 5.

Table 5. Impacts to Agricultural Protection Lands, Hydric Soils, and Steep Slopes

Soil Classification	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)
Prime Farmland	133.4	23.8	157.2
Farmland of Statewide Importance	128.7	13.9	142.6
Hydric Soils	46.8	5.7	52.5
Soils exceeding 15% slope	12.6	2.2	14.8

As shown in Table 5 above, approximately 157.2 acres of land classified as prime farmland and 142.6 acres of land classified as farmland of statewide importance will be impacted by Project construction, of which 23.8 acres and 14.8 acres, respectively, will be permanently impacted. Approximately 52.5 acres of soils listed as hydric by the NRCS will be impacted by Project construction, of which 5.7 acres will be permanently impacted. Total construction impacts to areas of steep slopes total 14.8 acres, of which 2.2 acres will be permanently impacted and 12.6 acres temporarily impacted. Permanent impacts on steep slopes are associated with installation of access roads (1.8 acres) and turbine crane pads (0.4 acre), while the majority of temporary impacts on steep slopes are associated with turbine workspaces and electrical collection lines.

2.2.1.3 Proposed Mitigation

Proposed mitigation measures for impacts to topography, geology, and soils remain as described in Section 3.1.3 of the DEIS. As indicated therein, a subsurface investigation will be performed at each proposed turbine and ancillary structure location prior to commencing construction to determine the site specific subsurface conditions and allowable soil/rock bearing capacities. Since the DEIS was released, a preliminary scope for this geotechnical work has been developed, and is described below. Prior to final design, a qualified geotechnical engineering firm will perform the general tasks outlined below. The information collected during the field investigation will be used to develop preliminary geotechnical recommendations, and will inform engineering evaluations to address geotechnical issues at the Project site, including seismic issues and the presence of the geologic fault.

The geotechnical engineer will prepare for and participate in a project kickoff meeting with the Project Sponsor and the design team to better understand the proposed elements of the development and coordinate the work. A preliminary site visit will then be conducted to observe existing conditions, including soil and rock features exposed at

ground surface, and to determine drilling equipment and access requirements for the site investigation. Available data will be reviewed on subsurface soil and rock conditions and groundwater levels at and near the site, from geologic maps, borings, and construction records. The preliminary geotechnical field investigation will include test borings and possibly test pits, to obtain initial information on the nature of the overburden soils, bedrock and groundwater levels at the Project site. This information will allow for the assessment of the general site conditions and preparation of the preliminary engineering evaluations. Technical monitoring of subsurface explorations will be employed so that depths and locations of subsurface explorations, as well as sampling methods, can be varied to meet the subsurface conditions encountered.

Soil and rock samples recovered from subsurface explorations will be analyzed by a laboratory testing program to aid in soil classification and to help determine engineering properties of the soil and rock at the site. Analyses will be related to the geotechnical engineering aspects of foundation design, site development, and construction. These analyses will include an evaluation of the general seismicity of the site, to allow for assessment of the impact seismicity will have on the proposed development. A geotechnical report will be prepared, which will include the following items as applicable to the Project site:

- Boring logs, test pit logs and records of other explorations indicating soil and rock conditions and water levels encountered.
- Location plan of subsurface explorations.
- Summary of subsurface geologic conditions as interpreted from the explorations.
- Results of laboratory tests, if performed.
- A summary of applicable design parameters for the foundations as provided by the turbine manufacturer.
- A discussion of foundation support alternatives for the turbines.
- Earthquake engineering considerations, such as site coefficient and liquefaction susceptibility of foundation soils.
- Comments on geotechnical aspects of construction, such as excavation and filling, controlled blasting, protection of adjacent structures and utilities, slope stability, and dewatering.
- Assessment of reuse potential of in-situ soils.
- Recommendations for the scope of the design phase geotechnical investigation, which may include but not be limited to additional test borings/test pits, seismic refraction testing, in-situ electrical resistivity testing, thermal testing, and falling weight deflectometer testing.

It is not anticipated that any turbines will need to be eliminated or relocated as a result of the geotechnical testing. Rather, the results of the subsurface investigations will determine the most suitable foundation design for the site-

specific conditions (McManus, 2014). The foundation designs and results of the geotechnical investigations will be available for the Board's review during the site plan review.

2.2.2 Water Resources

The following discussion supplements and revises information concerning water resources that was included in Section 3.2 of the DEIS. It is based on supplemental studies that have been completed since release of the DEIS, including a comprehensive wetland delineation (EDR, 2014a) and a report on hydrogeological resources (Haley & Aldrich, 2014). In addition, some supplemental information has been provided in response to public comments on the DEIS.

2.2.2.1 Existing Conditions

There have been several changes to the Project layout since the DEIS was released. These include changes to the number and acreage of participating parcels (see FEIS Section 2.1 for additional information). As a result, the FEIS Project area consists of 9,200 acres. Existing water resources within the revised Project area are described below.

2.2.2.1.1 Surface Waters

Based on the current geographic extent of the Project area, one Class A NYSDEC protected stream, an unnamed tributary of Deer River, is located at the south end of the Generating Site. In addition, two Class C(t) NYSDEC protected streams occur within the Project area; Boynton Creek, and an unnamed tributary to Boynton Creek, both of which are located in the western portion of the Project area along the transmission line (Figure 5).

2.2.2.1.2 Wetlands

With finalization of the Project layout, a comprehensive field delineation of all wetlands potentially subject to disturbance from Project construction was undertaken to supplement and refine the wetland inventory data and preliminary impact estimates included in the DEIS. The field delineation was completed during the summer and fall of 2013. The determination of wetland boundaries was conducted by EDR personnel following the three-parameter methodology described in the U.S. Army Corps of Engineers (USACE) *Wetland Delineation Manual* (hereafter referred to as the 1987 Manual) (Environmental Laboratory, 1987). Determination of wetland boundaries was also guided by the Interim *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: North Central and Northeastern Region* (hereafter referred to as the Regional Supplement) (USACE, 2009). Attention was also given to the identification of potential hydrologic connections between wetland areas that could influence their

jurisdictional status. Wetland boundaries were defined in the field with sequentially numbered pink surveyor's flagging.

Data were collected from one or more sample plots in each delineated wetland (depending on the size and diversity of ecological communities of the delineated area), and were recorded on USACE Routine Wetland Determination forms. Data collected for each of the wetlands delineated by EDR personnel included dominant vegetation, hydrology indicators, and soil characteristics. Detail regarding delineation methodology is included in the Wetland Delineation Report attached as Appendix B.

Wetland and Stream Descriptions

Refer to Section 3.2.1.3 of the DEIS for a discussion and description of wetland community types found within the Project area. Provided below is a description of the approximate amount of each wetland community type delineated within and adjacent to areas that could be impacted by Project construction.

EDR ecologists identified a total of 89 wetlands and streams within 100 feet (or more) of the proposed location of all Project components (i.e., the Project footprint). Wetlands within this area totaled approximately 291 acres. Information pertaining to the individual wetlands and streams that make up this total is summarized below in Table 6. Many of these wetlands continue past EDR's delineated boundary outside the area of potential disturbance. Their total size is thus larger than shown in Table 6. It is also worth noting that some of these wetlands or streams were delineated because at one time they were close to Project components, but the components have since been moved. Consequently, not all the wetlands listed in Table 6 will be subject to disturbance.

Wetlands and streams were classified according to the Cowardin classification system (Cowardin et al., 1979) as one or more of the following community types: emergent wetland, scrub-shrub wetland, forested wetland, lacustrine (farm ponds), and streams (perennial stream, or intermittent stream). All, or a portion of, the majority of wetlands within the Project area (51) were dominated by herbaceous vegetation and are characterized as emergent marsh (PEM). Twenty-five forested wetlands (i.e., communities dominated by trees that are 20 feet or taller) were delineated within the Project area, and 35 of the delineated wetlands are characterized as scrub-shrub wetlands (or at least partially scrub-shrub). Two small lacustrine wetlands (farm ponds) also occur within the Project area, one in an open field setting and the other within a scrub-shrub and emergent wetland.

Streams within the Project area are located within a wide variety of ecological communities, and the majority occur along the proposed transmission line. Most of the identified streams are intermittent, with a rocky substrate, and gentle (0-5%) gradient. They generally do not have well defined and established floodplains typical of larger,

perennial stream/river systems. The majority of streambeds did not have a substantial flow of water at the time of the field investigation, likely due to high temperatures and lack of adequate precipitation during the summer season. Water depths within the channels with stream flow averaged 2-10 inches (See Photos 25 to 33, Appendix B). All wetlands and streams in the vicinity of Project components are depicted in Figure 6 of Appendix B.

The functions provided by most of the delineated wetlands and streams appear to include maintaining surface water flows, recharging groundwater supplies, storm water detention, flood abatement, water quality improvement, wildlife habitat, and nutrient cycling. The functions provided by many of the delineated wetlands are limited due to 1) their isolated location within or adjacent to agricultural fields, 2) lack of structural diversity, and 3) past or on-going physical disturbance (e.g., agriculture). However, some of the larger delineated wetlands are considered valuable to the overall ecology of the area due to their size (some wetlands identified within the Survey Area are portions of much larger systems), structural diversity, wildlife habitat, and/or hydrologic functions.

Table 6. Delineated Wetlands and Streams

Wetland/Stream ID[1]	Community Type	Area[2]	Federal Jurisdiction[3]	State Jurisdiction[3]
A	Stream	0.20	Yes	No
B	PFO	0.78	Yes	No
C	PFO	0.79	Yes	No
D	PSS	0.25	Yes	No
E	Stream	0.08	Yes	No
F	Stream/PFO/PEM	6.73	Undetermined	Undetermined
G	PSS/PEM	9.29	Yes	Undetermined
H	PSS	1.14	Yes	No
I	PSS	6.68	Yes	No
J	PFO	0.21	Undetermined	No
K	PEM	0.25	No	No
L	PEM/RUP/Stream	0.29	Yes	No
M	PEM/RUP/Stream	0.20	Yes	No
N	PFO/Stream	1.31	No	No
O	PFO	2.46	Yes	No
P	PEM	0.46	No	No
Q	PEM/PSS	2.87	Yes	No
R	PEM/PFO	0.34	Yes	No
S	PEM/Open Water	1.04	Yes	No
T	PEM/IC	0.03	Undetermined	No
U	PEM	2.54	Yes	No
V	PFO/PEM	0.33	Yes	No
W	PFO	0.45	No	No

Wetland/Stream ID[1]	Community Type	Area[2]	Federal Jurisdiction[3]	State Jurisdiction[3]
X	PEM	0.19	No	No
Y	PEM	0.34	No	No
Z	PEM/PFO/PSS	22.68	Yes	No
AA	PFO	0.02	Undetermined	No
BB	PSS	1.70	Yes	No
CC	PSS/RUP	0.19	Yes	Yes
DD	PEM/PSS/PFO	7.45	No	No
EE	PFO	0.39	No	No
FF	PFO	0.11	Yes	No
GG	PFO	0.88	Undetermined	No
HH	PEM	0.05	Yes	No
II	PEM/PSS/RUP	5.08	Yes	No
JJ	PSS/PFO	13.41	Yes	No
KK	PSS	0.09	No	No
LL	PEM	2.60	Yes	No
MM	PSS	28.72	Yes	Yes
NN	PFO/IC	0.16	Undetermined	Undetermined
OO	PEM	0.21	No	No
PP	PSS	1.26	Yes	No
QQ	PEM/RUPEM	1.40	Yes	No
RR	PSS	2.71	Yes	No
SS	PSS	0.11	No	No
TT	PEM	0.95	Yes	No
UU	PEM	0.16	Yes	No
VV	PEM	2.97	Yes	No
WW	PFO	3.19	Yes	No
XX	PFO	9.21	Undetermined	No
YY	PEM	0.40	No	No
ZZ	PFO	3.23	No	No
3A	PSS/PEM/IC	3.89	Yes	No
3B	PEM/PSS	2.89	Yes	No
3C	PEM/PSS	3.34	Yes	No
3D	PEM/PSS	0.75	Undetermined	No
3E	PEM/PSS	1.51	Yes	No
3F	PEM	0.46	Yes	No
3G	PFO/Seep/Deer River	1.29	Yes	No
3H	PSS/PEM/RUPEM	0.97	Yes	No
3I	PSS	1.20	No	No
3J	PFO	1.39	Undetermined	No
3K	PEM/PSS	3.05	Undetermined	No

Wetland/Stream ID[1]	Community Type	Area[2]	Federal Jurisdiction[3]	State Jurisdiction[3]
3L	PEM	1.04	Yes	No
3M	PEM/Open Water	9.80	Yes	No
3N	PEM/PSS/PFO	8.42	Yes	No
3O	PSS/PEM	15.84	Yes	No
3P	PSS/PEM	0.78	Undetermined	No
3Q	PSS/PEM	0.74	Yes	No
3R	PSS/PEM	0.38	Yes	Undetermined
3S	PSS	3.81	Yes	Yes
3T	PEM	0.66	Yes	Yes
3U	PFO	6.33	Yes	Undetermined
3V	PSS	13.79	Yes	Yes
3W	PEM	0.33	No	No
3X	PEM	0.34	No	No
3Y	PEM	0.12	No	No
3Z	PEM	2.82	Undetermined	No
4A	PSS/PEM	0.56	Yes	Undetermined
4B	PSS	3.17	Yes	No
4C	PSS/PEM	2.80	Yes	Yes
4D	PEM	0.97	Yes	No
4E	PFO	9.40	Yes	Yes
4F	PEM/PSS	6.05	Yes	No
4G	PEM	1.71	Yes	No
4H	PFO	1.82	Yes	Yes
4I	PEM/Disturbed	2.52	Yes	Yes
4J	PEM	1.00	Yes	No
4K	PEM/PSS	24.32	Yes	Undetermined

[1] Delineated wetlands and streams were identified with a unique letter by EDR personnel during field investigations.
[2] Area is expressed in acres, and includes on-site portions of wetlands only.
[3] Based on field observations of hydrologic connections. Final jurisdiction will be determined by agency personnel.

In addition to the delineated streams and uplands summarized above in Table 6, EDR conducted further investigations in which the approximate boundaries of six more wetlands were defined. Wetland AW-1 is a large wetland (over 100 acres) located along the access road between turbines 44 and 49 that provides hydrological connectivity between delineated wetlands G, 3A, and 3B. Wetland AW-2 is adjacent to the access road to the meteorological tower southwest of turbine 55. It includes a stream channel and is likely hydrologically connected to delineated wetland I. Wetlands AW-3 and AW-4 are located in the vicinity of turbine 20; AW-4 corresponds to NYSDEC wetland CT-21. Wetlands AW-5 and AW-6 are located along the stretch of buried interconnect between turbines 15 and 18. These wetlands were not included in the formal delineation effort because the additional investigations were triggered by changes to the Project layout that occurred outside the growing season. Formal

wetland delineations will be conducted at each of these approximated wetlands during the 2014 growing season, prior to the submittal of the Joint Application for Permit.

2.2.2.1.3 Groundwater

At the request of Copenhagen Wind, LCC, Haley & Aldrich of New York, prepared an assessment of hydrogeologic conditions within the Generation Site and also evaluated potential impacts of the Project on groundwater resources and wells in the vicinity of the Project. Because the installation of electric transmission structures involves only minor excavation and surface disturbance, the Transmission Site was not included in the Haley & Aldrich study. See Appendix C for the full Report on Hydrogeology Resources and Potential Impacts.

The evaluation of the hydrogeologic conditions within the Generation Site (aquifers, soil survey, and well locations), area was based on publicly-available, published GIS data and literature information obtained from municipalities and landowners, and Haley & Aldrich's observations and experience. Two local well drillers were also contacted to discuss their professional experiences with water bearing units at the Generation Site and the surrounding area. In addition, Freedom of Information Law (FOIL) requests were sent to the NYSDEC and the Watertown District office of the New York State Department of Health (NYSDOH) for water well information, including driller's logs or other documentation, such as well type and construction, depth, subsurface soil or rock conditions, well yield, depth to groundwater and water quality information. Information regarding residential water well construction and groundwater characteristics and quality is primarily based on landowner responses, the Village of Copenhagen Annual Water Quality Report, and conversations with local well drillers.

<u>Aquifers</u>

The Northern Tug Hill sole source aquifer underlies the western half of the Project area (the Transmission Site and the western portion of the Generating Site), generally following the limits of the Sandy Creek watershed through this area. The Northern Tug Hill sole source aquifer is the principal source of drinking water for the Villages of Adams, Lacona, Mannsville and Sandy Creek, as well as the Hamlets of Adams Center and Pierrepont Manor (EPA, 2010). The EPA (2010) indicates that this aquifer is susceptible to contamination due to highly permeable soil characteristics and because the top of the aquifer is at ground surface in places. The Tug Hill Aquifer consists of unconsolidated soil and rock fragments sorted into layers that typically yield high amounts of water from coarse-grained sand and gravel, but low amounts from fine-grained sand, silt or clay. Therefore, water yield within this aquifer can vary dramatically depending on location.

A USGS mapped carbonate rock aquifer covers the northern portion of the Generation Site, associated with the Trenton Group limestones. Water in bedrock aquifers occurs in fractures and veins within the rock, and can provide substantial yields. For wells installed within limestone, water traverses through veins of higher permeability siltstone and typical yield is 10 to 15 gallons per minute. Yield within the shale units are significantly lower (less than one gallon per minute) due to lower permeability but can produce sufficient water for residential purposes. When these fractures occur at or near the soil surface they can be significant sources of groundwater recharge or discharge (springs).

On the hillslope and upland areas of the Generation Site, overburden soil deposits are not considered significant water-bearing units based on the relatively shallow depth and the generally fine-grained nature of the glacial till. Some minor amounts of water from glacial till have been noted by water well drillers in the area at the bedrock surface. A number of hand-dug and overburden water wells were reported by landowners throughout the area. Overburden wells were typically between 6 and 20 feet deep.

Residential Water Wells

A desktop review of residences located within 2,500 feet of proposed turbine locations was completed using current aerial and oblique orthoimagery (Haley & Aldrich, 2014). Based upon this desktop review, it was determined that 100 parcels with residential structures are located within 2,500 feet of a proposed turbine (see Figure 2 of the Haley & Aldrich Report in Appendix C, which also illustrates the location of the Village water wells). The majority of residences located within the Generation Site obtain their water from private hand-dug or drilled wells. Through a mailed survey to local landowners, Haley & Aldrich determined that most landowners who responded to the survey have few or no complaints regarding water quality and yield from their wells. Survey results also revealed that several landowners in the Generation Site obtained their water from springs.

It is expected that the majority of wells drilled on the hill slopes and in the upland areas are completed in, and draw water from, the bedrock aquifer. Information provided by landowners indicated that bedrock wells ranged in depth from 42 feet to 500 feet below the ground surface. Issues with groundwater yield were only reported in one well. That well was installed 500 feet deep and required hydraulic fracturing to obtain adequate yields. Well drillers described wells this deep as difficult to procure water, as they are typically installed within granite which lies under the limestone and has a low permeability (Haley & Aldrich, 2014).

Groundwater Characteristics

Groundwater flow characteristics are expected to vary depending on the water-bearing units present. As stated in the DEIS, according to the Lewis County Soil Survey, water in the Generation Site area is drained by the Black River to

Lake Ontario (generally westward). However, local variations in groundwater flow will occur from subsurface depositional features and groundwater withdrawal.

Flow direction in the upland soil units is anticipated to occur radially off the hilltops into the tributary stream valleys, with some downward infiltration into the bedrock. Gradients are currently unknown. Flow in the tributary stream deposits occurs longitudinally along the axis of the streams at generally steep gradients, which decrease as the streams approach the base level of the Black River Valley.

Flow within bedrock is dependent on the locations and orientation of fractures and veins. This can result in localized variation in flow directions; however, the overall flow directions will also be influenced by the topography of the bedrock surface, as groundwater will seek outlets in lower, exposed rock units, or will travel into overburden deposits at lower elevations. The upland rock mass can serve as a recharge source for the valley fill aquifers.

Groundwater levels in all aquifers will vary seasonally. For this region, typical seasonal fluctuations result in the highest groundwater levels during the April/May timeframe and the lowest levels during September or October. Significant temporary "spikes" in groundwater levels also occur from heavy precipitation events. Another factor in short-term groundwater level variation is evapotranspiration. In areas of dense vegetative cover, groundwater levels can drop significantly in a short period of time due to transpiration of water by plants during the spring/early summer "leaf-out."

Groundwater Quality

The Village of Copenhagen Water District provides water to several residences within the Generation Site. The Village's water plant has three wells on Stoddard Road, which are all 200 feet deep. The annual water quality report for 2012 states that water collected in their systems is filtered using a three bank filtration system and is disinfected with sodium hypochlorite. Groundwater quality meets Maximum Contaminant Levels allowed by the State (Haley & Aldrich, 2014).

Local well drillers interviewed, noted that the most common water quality issue in the area is hard water, typical of water obtained from limestone bedrock. Also seen is sulfur-rich and iron-rich water, common in groundwater withdrawn from shale bedrock. Local well drillers also noted that on rare occasions, salt water has been encountered in the area, typically in deep wells. Although the NYSDOH was unable to provide any additional information about local groundwater quality from domestic wells, these observations have been substantiated by landowner responses to the well survey.

Due to high agricultural land use in the area, fertilizer is used regularly on soils within the Generation Site. Elevated levels of nitrogen, potassium, and phosphorus therefore be could be expected in the groundwater.

According to the EPA Safe Drinking Water Information System, surrounding municipalities that presently rely on groundwater for their drinking water supply include the Towns of Champion and Rutland and the Village of Castorland (EPA, 2013c). Of these municipalities, health-based violations reported to the EPA include exceedances of lead and copper in 2005 and coliform in 2012, both in the Town of Rutland.

2.2.2.1.4 Floodplains

Although the layout of the Project site has changed, floodplains of associated main waterways are as described in Section 3.2.1.4 of the DEIS.

2.2.2.2 Potential Impacts

Based upon the FEIS Project layout, and the results of the wetland delineation and hydrogeological study conducted since release of the DEIS, a revised assessment of temporary and permanent impacts to water resources is presented below.

2.2.2.2.1 Construction

Surface Waters and Wetlands

Although Project activities are occurring in close proximity to a significant number of wetland and stream resources, permanent loss of federal jurisdictional and state protected wetlands and storms will be minimal. Avoidance and minimization of impacts was achieved through adherence to the following siting/design criteria.

- Large built components of the Project, including staging areas, the O&M facility, wind turbine generators, and the collection and POI substations, have been sited to avoid temporary or permanent impacts to wetlands.
- Number and overall impacts due to access road crossings were minimized by routing around wetlands whenever possible and utilizing existing crossings and narrow crossing locations to the extent practicable.
- Buried electric interconnect lines have been sited to avoid crossing forested wetlands whenever possible, cross wetlands at narrow points or at previously disturbed locations.
- Access road and interconnect crossings of wetlands and streams will utilize installation techniques that minimize the width of disturbance and associated temporary impacts.

- Forested wetlands have been purposefully avoided to the maximum extent possible. Areas where forested wetland impact occurs are primarily along the transmission line route. Impacts to forested wetland areas near turbine sites will be minimized by siting the construction staging areas in adjacent open agricultural fields (or otherwise outside of the forest) to avoid tree removal within the wetlands.

Other environmental or logistical constraints, such as land control, required set-backs, landowner preferences, buried utilities, and the desire to minimize impacts on residential or agricultural land use, made further avoidance or reduction of impacts to wetlands and streams unfeasible.

Based on the wetland delineation and current Project layout, total wetland impacts will total 11.1 acres[1]. The vast majority of these impacts (10.95 acres) will be temporary in nature, and subject to restoration and revegetation. Only 0.15 acre of wetland will be permanently impacted by Project construction (i.e., filled). Of the 11.35 acres of total impact, 6.42 acres will occur in forested wetlands; 0.41 acre will be allowed to regenerate, while 6.01 acres will be converted to successional communities (i.e., forest conversion impact). A more thorough breakdown of wetland impacts by Project component follows:

- Buried electrical collection lines – Temporary wetland impacts associated with the installation of buried electrical interconnect will occur due to soil disturbance and the clearing of vegetation associated with the direct burial installation methods and machinery described in Section 2.6.7 of the DEIS (cable plow or rock saw/trencher). Based on the results of the 2013 wetland delineation and the current Project layout, these impacts are estimated to total 1.85 acres. However, impacts associated with buried cable installation are temporary in nature, as preconstruction contours and soil conditions will be restored following installation, and native vegetation will be allowed to regenerate along the buried electrical interconnect right-of-way (ROW). The overall temporary footprint of buried electrical interconnect disturbance will disturb a width up to 50 feet at wetland and stream crossings. Wherever feasible, existing logging roads, ATV trails, or other existing areas of disturbance have been used to site buried electrical interconnect crossings of wetlands.

- Overhead collection lines – The installation of above ground electrical collection will temporarily disturb streams and wetlands during construction as a result of clearing (brush hogging, or similar clearing method requiring no removal of rooted woody plants). These impacts will total 0.42 acre, of which 0.15 acre is forested. Because the corridor will be maintained in low vegetation throughout the life the Project, the 0.15 acre of impact to forested wetlands represents a forest conversion impact.

[1] This includes a total of 1.29 acres of impact to approximated wetlands AW-1, AW-2, AW-3, and AW-5. These estimated impacts will be refined following the formal delineation (prior to the submission of the Joint Application for Permit).

- Access roads – Temporary and permanent impacts to surface waters and wetlands (loss of surface water/wetland acreage) will result from the construction of the permanent access roads necessary to accommodate construction and long-term maintenance and operation of the Project. Temporary impacts to wetlands and stream associated with access road construction include temporary grading and filling to install the crossing and/or accommodate the passage of large construction vehicles. Assuming a 40-foot maximum width of disturbance at all crossing locations, temporary disturbance to delineated wetlands and streams along Project access roads is estimated at 0.32 acre. These impacts are considered temporary because all excess fill will be removed from these areas following construction, and preconstruction contours and soil/channel conditions will be restored. Temporarily disturbed areas will be seeded and allowed to revegetate with native plant species. Based upon an assumed permanent road width of 20 feet, installation of Project access roads is anticipated to result in roughly 0.15 acre of permanent impact (i.e., filling) to wetlands/streams.

- Turbine workspaces – Temporary impacts to surface waters and wetlands will also occur within the workspaces for turbines 15, 18, 20, 23, 25, 27, 31, 32, 33, 34, 35, 44, 47, 48, 49, 56, and 57. These temporary impacts are estimated to total 5.18 acres. Temporary impacts to wetlands and streams associated with turbine workspace construction include temporary grading and filling to accommodate the passage of large construction vehicles. Impacts associated with the turbine workspaces are temporary and permanent impacts to surface waters and wetlands have been avoided by siting turbines outside of wetlands. However, because such areas may be maintained in low vegetation throughout the life of the Project, the 3.42 acres of impact occurring within forested wetlands represents a forest conversion impact.

- Transmission line – The installation the overhead transmission line will temporarily disturb streams and wetlands during construction as a result of clearing (brushhogging, or similar clearing method requiring no removal of rooted woody plants) and soil disturbance (from installation of poles and temporary access roads). Three transmission line poles are located in delineated wetlands, resulting in a temporary soil disturbance of 0.11 acre and permanent impact of 0.001 acre. Construction access roads will result in the temporary disturbance a total of approximately 1.19 acres of soils within delineated wetlands. In addition, a total of approximately 2.2 acres of forested wetlands will be cleared along the 100-foot right-of-way, and because the ROW will be maintained in low vegetation throughout the life of the Project, these impacts represent a forest conversion impact.

Ten wetlands delineated by EDR are associated with NYSDEC freshwater wetlands. No permanent impacts to NYSDEC freshwater wetlands or state-protected streams are proposed. Around every NYSDEC freshwater wetland is an adjacent area of 100 feet that is also regulated to provide protection for the wetland. Temporary disturbance to some of the 100-foot regulated adjacent areas will occur as a result of clearing and earthwork associated with the installation of buried electrical interconnect, access road, turbine workspaces, and overhead transmission line poles. These activities will result in a total of 4.8 acres of temporary impact to regulated adjacent areas, of which 1.22 acres is forested. Because these areas may be maintained in low vegetation throughout the life of the Project, the 1.22 acres of clearing in forested areas represents a forest conversion impact. Aside from the forest conversion impacts, there will be no permanent impacts to NYSDEC-regulated adjacent areas.

Other long-term impacts to wetlands and regulated adjacent areas will occur as a result of clearing activities in forested wetlands and uplands. This activity will not result in a loss of wetland acreage, but will result in the conversion of a total of 6.42 acres of forested wetlands to communities dominated by shrub and herbaceous vegetation (scrub-shrub/wet meadow/emergent wetland). These forest conversion impacts are broken out by Project component above. In addition, 0.41 acre of forested wetland will be temporarily impacted along buried collection lines and access roads, and allowed to regenerate naturally. Within the 100-foot regulated adjacent area, 1.22 acres of upland forest will be converted and maintained in a successional community (scrub-shrub) for the life of the Project. Most of the forest conversion impacts to wetlands and adjacent areas will occur along the transmission line.

Groundwater

Potential construction-related impacts to groundwater resources could include the following:

- Lowering of the water table, thereby impacting the yield of nearby water supply wells;
- A modification to surface water runoff patterns, thereby affecting groundwater recharge characteristics;
- Alteration of groundwater chemical quality; or
- Loss of wetlands or other surface water resources that may serve to recharge groundwater resources.

However, based on the results of the hydrogeological report, construction of the wind turbine foundations is unlikely to result in a significant adverse impact to the groundwater resources in the vicinity of the Project (Haley & Aldrich, 2014). This conclusion is based on the fact that the majority of the construction would involve only shallow soil and/or bedrock excavation, generally within 10 feet or less of the existing ground surface. At this depth altering bedrock hydrologic structure is unlikely. Furthermore, construction activities will generally be sited away from existing residential water wells and surface water features. As noted previously, 100 parcels with residences are located within 2,500 feet of a proposed wind turbine. There are no residences located within 1,000 feet of the

nearest turbine site. Although aquifer resources are near the surface and generally unconfined within the Generation Site area, the majority of the proposed turbine locations are outside of mapped aquifer boundaries.

The construction activity with the greatest potential for impacting groundwater resources is installation of the turbine foundations. The spread footing foundation likely to be installed on this Project would require excavations approximately 8 feet deep and 75 feet in diameter. Such construction could involve bedrock removal, based on the occurrence of shallow bedrock within the area. Foundation installation would involve commonly-utilized construction methods such as placement of steel-reinforced concrete and shallow excavation. With the implementation of best management practices such work can be designed to keep any groundwater disturbances isolated and localized, as described below.

It is anticipated that, bedrock removal would be achieved using conventional excavating equipment and that blasting will not be required. However, it is possible that some excavations could require the use of blasting techniques if the bedrock is not ripable with an excavator or breakable using a pneumatic hammer. If blasting is necessary, the procedure will involve the use of controlled blasting techniques. Blasting would be done in accordance with an approved blasting plan, using appropriately-sized charge weights and delays to minimize the amount of ground vibration generated and to limit the bedrock fracturing to the proposed foundation area. Based on the anticipated distances between turbine locations and area residences, the potential for alteration of fractures/fissures carrying groundwater is considered to be very low. As such, no impact to the water level, or water yield from water supply wells, is expected due to blasting. If an impact were to occur, it would most likely be a temporary change in yield during construction (Haley & Aldrich, 2014).

During excavation, groundwater infiltrating an excavation site may require removal by pumping. This would be only a temporary practice and the majority of this water would return to the aquifer through infiltration. The volume of loss would not be sufficient to lower groundwater levels at a significant distance from the excavation locations.

The turbine foundations will require placement of large volumes of concrete that in places will come in direct contact with groundwater. During the concrete curing process, it is possible that the groundwater quality in proximity to the concrete mass may experience a rise in pH value. However, this effect would be localized to the foundation and would be short-lived. Any effect would be quickly diluted over distance, and natural surface water infiltration would restore normal pH levels in a relatively short period of time.

It is anticipated that wooden poles will be used for the overhead transmission line and a couple short segments of the electrical collection lines. These poles will likely be treated with creosote, pentachlorophenol, copper naphthenate or

other similar preservatives. These lumber preservatives are widely used in the utility, railroad and construction industries. Numerous studies (Brooks, 2001; and several others) have extensively evaluated potential environmental impacts from the use of such preservatives in many environments, including aquatic environments such as streams and wetlands. In general, the presence of treated wooden poles results in some loss of polynuclear aromatic hydrocarbon (PAH) compounds to the subsurface; however, this loss is confined to soils in the immediate vicinity (within several inches) of the wooden pole or structure, and the PAH compounds are not present in concentrations that would affect human health or the environment. Furthermore, the PAHs do not dissolve readily into groundwater and are generally not present at concentrations that are stressful to aquatic plants and animals. Characteristic loss of metals to soils from metal-bearing preservatives shows similar results.

Based on these findings and the wide spacing and limited use of poles anticipated for this Project, the presence of treated wood poles would not be expected to have an adverse impact on surface water or ground water resources.

Floodplains

Potential construction-related impacts to floodplains are as described in Section 3.2.2.1.3 of the DEIS.

Although final engineering of the proposed transmission line is not complete at this time, it is possible that some poles will be located within this floodplain, which will result in small areas of soil disturbance related to pole installation. The Deer River's 100-year floodplain is crossed by roughly 360 linear feet of proposed overhead collection line, located between Turbines 42 and 46. It is not anticipated that any impacts would occur to the Deer River or its floodplain, as the River would be spanned by the overhead line, and the poles would be located in upland locations.

2.2.2.2.2 Operation

Section 3.2.2.2 of the DEIS accurately describes potential impacts to water resources that could result from Project operation. However, the following supplemental information is being provided in response to public comments on the DEIS.

Surface Waters and Wetlands

The proposed Project will not result in significant conversion of land to built/impervious surfaces. Permanent impervious surfaces, including the O&M facility, tower bases, crane pads, access roads, and the substations will add a total of approximately 45 acres of impervious surface to the 9,200-acre Project area (i.e., will affect <0.5% of the area). Consequently, no significant changes to the rate or volume of stormwater runoff are anticipated.

Project access roads are designed to accommodate future truck traffic that may be required to perform routine maintenance on the wind turbines and substation facilities. However, major repairs or decommissioning may require temporary road widening/upgrades to accommodate cranes or other large vehicles. This could result in additional impacts to streams and wetlands during Project operation. These types of impacts are typically permitted by the Nationwide Permit program (i.e., Nationwide Permit No. 3 Maintenance), and do not require mitigation since they would be temporary. Because the need for, and timing of, major repairs and/or decommissioning events are currently unknown, it is not possible to estimate the quantity of impacts that may occur, but they are anticipated to be minor, localized and temporary in nature.

Groundwater

As indicated in the DEIS, over the long term, addition of small areas of impervious surface to the Project area in the form of permanent access roads, crane pads, the O&M building, and the collection and POI substations will have a minimal effect on groundwater recharge. Turbine foundations installed below the water table are not anticipated to have any measurable effect on groundwater levels or flow patterns (Haley & Aldrich, 2014). The migration of groundwater along buried interconnect trenches could have a minor effect on groundwater flow paths, and a continued risk of fuel spills during operation/maintenance may also affect groundwater.

2.2.2.3 Proposed Mitigation

Proposed mitigation for anticipated impacts to water resources is described in Section 3.2.3 of the DEIS. However, based on the supplemental studies conducted, the revised analysis of impacts included in the FEIS, and in response to public comments, the following additional mitigation measures will be employed.

If blasting is required for this Project, a blasting plan that follows all applicable State and Town blasting codes will be implemented (see DEIS Appendix C). The procedure will involve the use of controlled blasting techniques in one or more benches to create minimum breakage outside the line control and create maximum rock fragmentation within the target area (i.e., the foundation hole). Appropriately-sized charge weights and delays would be used to minimize the amount of ground vibration generated and to limit the bedrock fracturing to the proposed foundation area. The contractor will use sufficient stemming, matting or natural protective cover to prevent fly rock from leaving property owned or under control of the permittee or operator or from entering protected natural resources or natural buffer strips. All blasting and excavation activities will be monitored by an Environmental Monitor to assure that all required protective measures are in place and to address any water-related concerns that may arise.

No water supply wells or residences were identified within 1,000 feet a proposed wind turbine (Haley & Aldrich, 2014). However, to minimize potential impacts to water wells, the contractor will undertake a site walk-over prior to construction and clearly stake wells identified within 500 feet of construction activities. In addition, prior to blasting at any site, a pre-blast survey will be conducted. The pre-blast survey will inspect the blast site and adjacent areas. The survey will document existing conditions and will include, but not be limited to buildings/structures, water supply wells, utilities (above and below ground). The survey will include written as well as photographic documentation of existing conditions. All blasting shall be monitored with a properly calibrated seismograph, to be installed at the nearest inhabited structure and any other sensitive structure agreed to by the Town. At the completion of blasting, a post-blast survey will be conducted of the same facilities (structures, foundations, water supply wells, utilities, etc.) documented during the pre-blast survey. Findings inconsistent with those reported during the pre-blast survey will immediately be provided to the contractor/subcontractor/developer, and will be documented in writing and photographed. Depending on the nature of the inconsistency, specific corrective actions will be developed in consultation with the affected party. A tank of freshwater will be kept onsite during Project construction so that a temporary emergency water supply is available for immediate deployment in the extremely unlikely event that a residence/structure loses water supply due to blasting activities. This stopgap measure will ensure that no property owners go without water while more permanent corrective actions are being developed and implemented.

Copenhagen Wind, LLC's mission is to complete the construction of the wind facility with the least amount of impact and inconvenience to residents in the Towns of Denmark, Champion and Rutland. Copenhagen Wind, LLC will identify individuals that can be contacted if any resident has a complaint during Project construction or operation. During construction, this individual will be the Project Site Construction Manager. During operation, the primary point of contact will be the plant manager. Contact information for these individuals will be posted at the local Project office, published in the local newspaper, and provided to all Town Supervisors/Village Mayors, Town/Village Clerks, and codes enforcement officials. Upon receipt of a question or a concern, the Site Construction Manager or Plant Manager will contact the individual within 24 hours of receipt of a complaint, and work with them in good faith to resolve the issue. Copenhagen Wind, LLC is committed to resolving concerns on a case-by-case basis. During the construction period, a copy of any complaint received by Copenhagen Wind, LLC will be provided to the on-site Environmental Monitor, who will provide input as necessary to resolve the complaint.

During Project operation, records of complaints will be shared with local codes enforcement officials. If the on-site Project representative and the individual do not mutually agree that a concern has been appropriately addressed, the on-site representative will refer the concern to upper-management within Copenhagen Wind, LLC and the Town officials, who will continue to work with the individual to resolve the concern.

2.2.3 Biological Resources

2.2.3.1 Existing Conditions

See Section 3.3.1 of the DEIS. In addition, the following supplemental information is being provided in response to public comments.

2.2.3.1.1 Vegetation

There have been several changes to the Project layout since the DEIS was released. These include changes to the number and acreage of participating parcels (see FEIS Section 2.1 for additional information). As a result, the FEIS Project area consists of 9,200 acres.

Additional ecological surveys were conducted in the Project area throughout the 2013 growing season, during June, July, August, September, and October. A list of plant species observed on-site is included as FEIS Appendix D. These surveys revealed that no new ecological communities occur within the modified Project area. While the community characteristics described in the Section 3.3.1.1.1 of DEIS remain accurate (e.g., dominant species), the acreages have changed. The 9,200-acre Project area is now comprised of 4,825 acres of agricultural land (52.4%), 2,885 acres of forestland (31.4%), 885 acres of successional shrubland (9.6%), 351 acres of successional old fields (3.8%), and 220 acres of disturbed/developed land (2.4%). See FEIS Figure 6 for updated ecological community mapping.

2.2.3.1.2 Fish and Wildlife

White-nose Syndrome

As described in Section 3.3.1.2.2 of the DEIS, nine species of bat occur in New York State (Stegemann & Hicks, 2008). These include six species of cave bats (big brown bat, eastern small-footed myotis, little brown bat, Indiana bat, northern long-eared bat, and tri-colored bat) and three species of tree bats (silver-haired bat, eastern red bat, and hoary bat). Cave bats utilize specialized habitats for winter hibernacula, including limestone caves, old mines, and old well shafts. Populations of cave bats in eastern North America are experiencing unprecedented mortality due to an emergent disease condition identified as “white-nose syndrome” (WNS). The name derives from a white, dusty film that accumulates on the muzzles, ears, wings, and occasionally on other body parts of infected bats. The primary disease agent is *Geomyces destructans*, a psychrophilic (cold-loving) fungus (Blehert et al., 2009; Gargas et al., 2009). First detected in Schoharie County in February 2006, WNS has spread across eastern North America, killing more than 5.7 million bats to date (USFWS, 2013a). All six cave-dwelling bat species in New York State are

impacted by WNS, with mortality estimates ranging from 90% to 100% in affected hibernacula (NYSDEC, 2012). Population declines caused by WNS have prompted the USFWS to review the status of several of these species.

On January 21, 2010, the Center for Biological Diversity (CBD) petitioned the Secretary of the Department of the Interior to list the eastern small-footed bat (*Myotis leibii*) and northern long-eared bat (*Myotis septentrionalis*) as threatened or endangered under the under the Endangered Species Act (ESA) of 1973 (CBD, 2010). On June 29, 2011, the USFWS announced a 90-day finding in the Federal Register (Volume 76, No. 125, p. 38095), concluding that sufficient information was provided in the CBD petition to conduct a more thorough analysis of the status of these species. This positive finding initiated a formal review to determine if listing of either eastern small-footed or northern long-eared bats, or both of these species, is warranted. On October 2, 2013, the USFWS announced a 12-month finding in the Federal Register (Volume 78, No. 191, p. 61046), concluding that listing the eastern small-footed bat is not warranted, but that listing the northern long-eared bat is warranted. Accordingly, the USFWS is proposing to list the northern long-eared bat as a federally endangered species throughout its range under the ESA. This announcement initiated a 60-day public comment period, subsequently extended to 90-days, along with the solicitation of peer review from scientific experts. The USFWS will evaluate information provided during the comment period, and make a final decision on listing the species within 12 months. Within New York State, populations of northern long-eared bat have declined by 98% since the onset of WNS (NYSDEC, 2012). Mist-netting in the Project area in 2012 captured three individual northern long-eared bats (Sanders, 2013b).

The USFWS is also considering the status of the little brown bat (*Myotis lucifugus*). A status review prepared by scientists at Boston University was submitted to the USFWS in December 2010, along with a request for the Service to determine if this species needs protection under the ESA. This status review determined that an endangered listing is warranted, because "extinction is virtually certain to occur in the core range of this species by 2026, and rangewide extinction may very well follow based on known and predicted infection dynamics of WNS" (Kunz & Reichard, 2010). However, to date the USFWS has taken no formal action with regard to listing the little brown bat. Within New York State, populations of little brown bat have declined by 90% since the onset of WNS (NYSDEC, 2012). In 2012 surveys at the Project area, one myotid call was recorded during acoustic monitoring (Sanders, 2012b), and an additional 13 myotid calls were recorded during mist-netting (Sanders, 2013b). However, acoustic surveys cannot distinguish between different *Myotis* species, and therefore, the presence of little brown bat cannot be determined with certainty based on these recordings (i.e., the calls could have been made by little brown, eastern small-footed, northern long-eared, or Indiana bats). No little brown bats were captured during the mist-netting in the Project area (Sanders, 2013b).

2.2.3.2 Potential Impacts

2.2.3.2.1 Construction

Vegetation

As indicated in Section 3.3.2.1.1 of the DEIS, Project construction will result in temporary and permanent impacts to vegetation within the Project area. The construction activities, impact assumptions, and types of impact described in the DEIS remain accurate. However, the Project layout has changed since the DEIS was released, including a reduction from 62 to 47 proposed turbine sites. Based on the revised Project layout, fully described in Section 2.1 of the FEIS, construction activities will result in disturbance to approximately 550.5 acres within the Project area. As indicated below in Tables 7 and 8, the majority of the calculated impacts will be temporary, and native vegetation will be allowed to regenerate following restoration of areas disturbed during construction.

Table 7. Impacts to Vegetation by Project Component

Location	Total Disturbance (acres)	Temporary Disturbance (acres)	Permanent Loss (acres)
Wind Turbines/Workspaces	135.0	125.6	9.4
Access Roads	154.3	123.4	30.9
Buried Collection Lines	117.1	117.1	0.0
Overhead Collection Lines	2.8	2.8	0.0
Transmission Line	103.0	102.9	<0.1
Transmission Line Access Roads	20.8	20.8	0.0
MET Towers	3.0	2.7	0.3
Staging Area	8.0	8.0	0.0
Collection Station	2.0	0.5	1.5
Point of Interconnect Station	1.0	0.6	0.4
O&M Building	3.5	1.0	2.5
TOTAL	550.5	505.5	45.0

Table 8. Impacts to Vegetation by Ecological Community

Ecological Community[1]	Total Disturbance (acres)	Temporary Disturbance (acres)	Permanent Loss (acres)
Active Agricultural Land	319.7	290.1	29.6
Forested[2]	131.4	121.5	9.9
Successional Shrubland	58.5	55.8	2.7
Successional Old Field	37.9	35.7	2.2
Disturbed-Developed	2.9	2.3	0.6
TOTAL	550.5	505.5	45.0

[1] Excludes wetland and open water communities. Construction-related impacts to wetlands are discussed in FEIS Section 2.2.2.
[2] Of the 131.4 acres of impacted forestland, 9.9 acres will be converted to built facilities, 76.6 acres will be maintained as successional shrubland or old field communities for the life of the Project, and 44.9 acres will be allowed to regenerate naturally upon completion of construction activities. However, because of the long-term affect such disturbance will have on forested communities (i.e., the forests will not fully regenerate during the life of the Project), the entire 121.5 acres of "temporary" forest impact can be considered forest conversion impacts.

Forest Fragmentation

As described in FEIS Section 2.1, a number of changes have been made to the Project layout since release of the DEIS, in part to reduce impacts to forested areas. A total of 15 turbines have been eliminated from the DEIS layout. Of these, 11 had been located in forested areas (Turbines 7, 16, 22, 28, 29, 58, 59, 60, 61, 62, and 63). As a result of these Project changes, the anticipated temporary and permanent impacts to forested communities are significantly lower than had been predicted in the DEIS (see FEIS Table 3 for side by side comparison).

Thirteen turbines in the FEIS layout remain in forested areas[2]. However, they are generally located adjacent to the edges of agricultural fields. Nine of the 13 are within 150 feet of the forest edge, while the remaining four are located 155 feet, 207 feet, 312 feet, and 420 feet from the edge, respectively. Access roads and other Project infrastructure are also generally located at the edges of forests and agricultural fields. As such, substantial forest fragmentation is not expected as a result of Project construction.

Wildlife

As indicated in the DEIS, construction-related impacts resulting from the Project are not anticipated to be substantive enough or of a sufficient duration to significantly affect local populations of any resident or migratory wildlife species.

2.2.3.2.2 Operation

Raptor Mortality

Raptor mortality from collision with turbines has been low at most operating wind power projects outside of California and some sites in Europe, which are now generally considered to have been poorly sited. Based on comparative

[2] Turbines located within forested areas have often generally been sited there at the specific request of landowners.

studies of avian mortality rates at wind farms in New York State and raptor passage rate through wind farm sites, the overall raptor fatality rate at the Project is expected to be low. Post-construction ground searches conducted at several operating wind power projects in Wyoming County, New York have consistently documented low raptor mortality. At the Noble Bliss Windpark, surveys documented seven raptor carcasses: three red-tailed hawks (one during standardized surveys and two incidental reports), a sharp-shinned hawk during the 2008 survey (Jain et al., 2009e), and three red-tailed hawks (one during standardized surveys and two incidental reports) during the 2009 survey (Jain et al., 2010c). Post-construction ground searches conducted at the Noble Wethersfield Windpark in 2010 found two raptor carcasses; one red-tailed hawk and one sharp-shinned hawk (Jain et al., 2011a). At the High Sheldon Wind Farm, mortality of only three raptors (a sharp-shinned hawk and three turkey vultures) was documented during two years of post-construction studies (Tidhar et al., 2011b). These recent results are similar to those of other studies conducted in New York State and the northeast, and similar levels of mortality would be expected at the proposed Project.

The location for this project is not in the vicinity of any "leading lines", such as coast lines or mountain chains (examples include Lake Ontario and the Appalachian Mountains) that would tend to concentrate raptor migration (Goodrich & Smith, 2008). However, even where concentrated hawk migration does occur around wind energy sites, evidence to date shows that risk to raptors is not great and not likely to be biologically significant. At the Mountaineer Wind Energy Facility on Backbone Mountain (a long, linear ridge) in West Virginia, a study by Kerns and Kerlinger (2004) found that only one raptor, a red-tailed hawk, was killed during the study period, which was focused on the spring and fall migratory periods (26 days of surveys in the spring, two days in the summer, and 33 days in the fall). Reports from Tarifa, Spain, where raptor migration is highly concentrated, strongly suggest that migrating raptors rarely collide with turbines (DeLucas et. al., 2004). Several studies have documented raptor collision avoidance behaviors at wind facilities (Whitfield & Madders, 2006; Chamberlain et. al., 2006). Although the mechanism of turbine avoidance is unknown, most raptors are diurnal and have good eyesight, suggesting they may be able to detect turbines visually as well as acoustically.

As indicated above, there are no geographical or topographic features (e.g., mountain ridgelines, river valleys, or coastlines) in the vicinity of the Project area that would attract or concentrate migrant raptors in large numbers. This was confirmed by on-site raptor migration surveys, which did not identify any concentrated flight paths in either spring or fall. The 2012 raptor study recorded a migratory passage rate of 0.492 raptors/hour in the spring, compared to an average passage rate of 10.2 raptors/hour at the three other sites in the region with available spring data, and a passage rate of 0.069 raptors/hour in the fall, compared to an average passage rate of 8.07 at the three other sites in the region with fall data (Sanders, 2013a). These passage rates are extremely low relative to what is seen at hawk watches and other raptor concentration areas. Consequently, the impacts to migrating raptors from the development

and operation of the Project are anticipated to be low. Based on the general lack of elevated risk factors and the results of fatality monitoring at other New York wind projects, no biologically significant adverse impacts on raptors are anticipated from operation of the Project.

Bird Mortality Approximations

As indicated in Section 3.3.2.2.2 of the DEIS, bird fatality rates at New York State wind energy sites where recent, rigorous post-construction mortality monitoring has been conducted have varied between 0.66 and 9.59 birds/turbine/study period and between 0.44 and 5.81 birds/MW/study period. It is anticipated that the bird fatality rates for the Project will be within the range of bird fatality rates documented in the New York studies summarized in DEIS Table 9. This section updates the estimates presented in the DEIS, based on the changes in Project layout (i.e., the reduction in the number of turbines proposed). A lower bound estimate of 32 avian fatalities per year is based on the results of the 2008 survey results from the Noble Bliss Wind Project (Jain et al., 2009e). An upper bound estimate of 451 avian fatalities per year is based on the results of 2006 surveys conducted at the Maple Ridge Wind Project (Jain et al., 2007).

An average fatality rate of 116 birds per year at the Copenhagen Wind Farm was calculated based on the weekly bird/MW/study period rates documented in other studies. Due to the close proximity of the Project area to the Maple Ridge facility, there is some concern that avian mortality from the Project is likely to resemble the mortality rates at Maple Ridge, which are among the highest in the state. Therefore, to address this possibility, an alternate average Project fatality rate of 265 birds per year was calculated based on the average mortality rate of 5.63 birds per turbine per year observed at the Maple Ridge Wind Project over three years of study[3] (Jain et al., 2007; Jain et al., 2009a; Jain et al; 2009b). Although mortality rates at the proposed Project could resemble those at Maple Ridge, the differences between the two Projects should also be acknowledged. The Maple Ridge facility consists of 195 turbines, more than four times the number proposed for Copenhagen (i.e., 47 turbines). If larger facilities are harder for birds to avoid, then mortality rates at the proposed Project may be somewhat lower.

Cumulative mortality impacts may arise from interactions between the impacts of the proposed Project and the impacts of other wind energy facilities in the area. Such projects include the operational Maple Ridge Wind Project, a 195-turbine facility located 2.4 miles to the south, and the planned Roaring Brook Wind Farm, a permitted 39-turbine facility located 9.5 miles to the south. Using the range of mortality rates observed across New York State (0.66 to 9.59 birds/turbine/study period), cumulative avian mortality for the Copenhagen, Maple Ridge, and Roaring Brook wind energy facilities is estimated between approximately 186 and 2,695 birds per year. It is clear that more projects

[3] To present the absolute worst-case mortality rates, this average was calculated using the highest observed fatality rates per year (i.e., daily surveys in 2006 and weekly surveys in 2007 and 2008).

equate to more collision fatalities. However, it is difficult to determine significance of this potential cumulative mortality, given the large range in estimated impacts and the variety of species affected.

Bat Collision Risk and Mortality Approximations

The DEIS reported that collision mortality for bats can be substantially greater than that seen for birds, and that migratory tree-roosting bat species (hoary bat, eastern red bat, and silver-haired bat) appear to be especially susceptible to colliding with the operating wind turbines. Results of fatality studies at wind energy facilities in the eastern United States as well as several western sites (U.S. and Canada) seem to indicate that these species are more susceptible to collisions with wind turbines than resident bat species (NWCC, 2010; Kunz et al., 2007; Arnett et al., 2008). However, cave bats are also susceptible to collision mortality, including rare and uncommon species, such as Indiana bat, northern long-eared bat, little brown bat, and tri-colored bat. There have been five recorded instances of mortality to endangered Indiana bats at wind energy facilities in Ohio, Indiana, Pennsylvania, and West Virginia; no known Indiana bat fatalities have occurred at wind farms in New York State (USFWS, 2013b). See Section 2.2.3.3 below for a discussion of the Habitat Conservation Plan (HCP) the Applicant will prepare to mitigate for potential impacts to Indiana bat.

As indicated in Section 3.3.2.2.2 of the DEIS, bat fatality rates at New York State wind energy sites where recent, rigorous post-construction mortality monitoring has been conducted have varied between 0.7 and 40 bats/turbine/study period and between 0.46 and 26.7 bats/MW/study period. It is anticipated that the bat fatality rates for the Project will be within the wide range of bat fatality rates documented in the New York studies summarized in DEIS Table 10. This section updates the estimates presented in the DEIS, based on the changes in Project layout (i.e., the reduction in the number of turbines proposed). A lower bound estimate of 33 bat fatalities per year is based on the results of the 2008 survey results from the Munnsville Wind Project in Madison and Oneida Counties, New York (Stantec, 2009). An upper bound of 1,880 bat fatalities per year is based on the results of 2009 surveys conducted at the Cohocton and Dutch Hill facilities (Stantec, 2010, 2011a).

An average fatality rate of 369 bats per year at the Copenhagen Wind Farm was also calculated based on the weekly bat/MW/study period rates of all the studies provided in DEIS Table 10. Due to the close proximity of the Project area to the Maple Ridge facility, there is some concern that bat mortality from the Project is likely to resemble the mortality rates at Maple Ridge, which are among the highest in the state. Therefore, to address this possibility, an alternate average Project fatality rate of 752 bats per year was calculated based on the average mortality rate of 16 bats per turbine per year observed at the Maple Ridge Wind Project over three years of study[4] (Jain et al., 2007; Jain

[4] To present the absolute worst-case mortality rates, this average was calculated using the highest observed fatality rates per year (i.e., daily surveys in 2006 and weekly surveys in 2007 and 2008).

et al., 2009a; Jain et al; 2009b). However, it should be noted that due to the effect of WNS, the population of myotid bats in New York State has been substantially reduced since the post-construction mortality data were collected at Maple Ridge data. Consequently, the actual per-turbine mortality numbers for the Copenhagen Wind Farm are likely to be lower than those seen at Maple Ridge.

Cumulative mortality impacts may arise from interactions between the impacts of the proposed Project and the impacts of other wind energy facilities in the area. Using the range of mortality rates observed across New York State (0.7 to 40 bats/turbine/study period), cumulative bat mortality for the Copenhagen, Maple Ridge, and Roaring Brook wind energy facilities is estimated to be between approximately 197 and 11,240 bats per year.

2.2.3.3 Proposed Mitigation

See Section 3.3.3 of the DEIS. In addition, the following revised and/or supplemental information is being provided in response to public comments.

Invasive Species Control Plan

The Invasive Species Control Plan (ISCP) described in DEIS Section 3.3.3.1 will be implemented to control the introduction and spread of the target species identified in Appendix E. In addition, the Applicant and its contractors will comply with New York State regulations restricting the movement of firewood. In accordance with 6 NYCRR §192.5, no untreated wood cut as a result of Project construction activities will be moved further than 50 miles.

Overhead Transmission and Collector Lines

Avian mortality can result from collision with power lines and poles, and, if structures are not designed properly, from electrocution. Collision mortality associated with power lines is most common at facilities located between feeding and roosting areas of flocking birds, particularly at sites near waterbodies where fog is common, making the lines less visible. Collisions most often occur with overhead static wire, which may be less visible than energized conductors due to its smaller diameter. Heavy-bodied, less agile birds and those within flocks appear to lack the ability to quickly negotiate obstacles, and are therefore more vulnerable to power line collisions. Most electrocutions occur when the head-to-foot or wrist-to-wrist distance of a bird is larger than the distance between energized conductors or between and energized conductor and grounded hardware. Consequently, most electrocutions are of large birds.

The overhead transmission line will be designed in accordance with Avian Power Line Interaction Committee (APLIC) guidelines to minimize impacts on birds. Specific measures to prevent avian mortality associated with transmission lines include:

- To reduce risk of collision, APLIC (2013) recommends that power lines in high risk areas (i.e., near rivers, lakes, or large wetlands) be marked to make the wires more visible to flying birds. A variety of line marking devices are commercially available, including hanging markers, coils, and aviation marker balls.

- The physical separation between energized and/or grounded parts is the key electrical design factor in preventing avian electrocutions. This involves framing structures so that there is adequate separation between phases (and/or between phases and grounds) to accommodate large perching birds. Based on the dimensions of eagles, APLIC (2013) recommends 60 inches of horizontal separation and 40 inches of vertical separation. Where adequate separation is not feasible, APLIC recommends that covers be applied to phases or grounds. Examples of potentially suitable covers include insulator/conductor covers, bushing covers, arrester covers, cutout covers, and jumper wire covers.

As indicated in Section 2.5.3 of the DEIS, underground cabling is the preferred design option for the electrical collector system. However, overhead cables may be used where requested by landowners or where underground installation is prohibited or infeasible due to constraints such as rivers, streams or creek crossings, bedrock, etc. According to APLIC, the transition from underground lines to overhead collectors uses a riser pole with switches and arrestors that is atypical from most utility designs. APLIC (2013) offers specific guidance on the design and construction of risers and overhead 34.5 kV collection lines. These measures include:

- Designing structures with adequate clearances between phases (and/or between phases to grounded conductors or equipment);
- Designing jumper conductors with covered wire;
- Installing surge arrestors with cap and covered wire;
- Installing pad-mounted switchgear, or installing switch on long fiberglass crossarms to provide >60" separation between phases;
- Designing all insulators with un-bonded hardware, or using insulators that are >60"; and
- Designing with covered ground wire and molding.

<u>Habitat Conservation Plan</u>

To address concerns over potential impacts to Indiana bats, Copenhagen Wind Farm, LLC will be applying for an Incidental Take Permit from the USFWS and preparing a Habitat Conservation Plan (HCP). The HCP will describe the anticipated effects of the possible taking, along with strategies to minimize, monitor, and mitigate such impacts, and the available funding to implement the monitoring and mitigation measures. Mitigation measures could include any or all of the following strategies:

- seasonal tree cutting restrictions,
- tree planting or other compensatory mitigation for tree removal,
- post-construction monitoring,
- curtailment of turbines at low wind speeds at night during migratory periods, and
- adaptive management.

The Project Sponsor is committed to implementing the range of mitigation measures listed above. Specific details of these strategies (e.g., study methods and duration) will be developed in consultation with the USFWS and NYSDEC.

2.2.4 Climate and Air Quality

2.2.4.1 Existing Conditions

Existing climate conditions and regional air quality are as described in Section 3.4.1 of the DEIS. Adjustments to the proposed Project do not affect these conditions.

2.2.4.2 Potential Impacts

Construction-related impacts to climate and air quality are as described in Section 3.4.2.1 of the DEIS, and are related to vehicle exhaust and fugitive dust generated during earth moving activities and/or travel on unpaved roads. However, because the Project has been reduced in size, it is anticipated that these construction impacts would be proportionally reduced. The operating Project's positive impact on air quality through displacement of energy produced by conventional power plants has been slightly reduced due to the decrease in the number of wind turbines proposed. The operation of this Project is anticipated to annually produce 209,977 megawatt-hours (MWh) of electricity with zero emissions (assuming 47 turbines, each with a nameplate capacity of 1.7 MW, operating at a 35% capacity factor annually), except very small emissions from vehicles servicing the facilities and energy required to operate the O&M facility. Power delivered to the grid from this Project can off-set the generation of energy at existing conventional power plants, as discussed in Section 2.2 of the DEIS. Based on emissions rates for the average fuel mix in the Upstate New York Region (EPA, 2013a), this 209,977 MWh wind farm is estimated to annually displace:

- 83,024.9 pounds (41.5 tons) of NO_x
- 206,806.3 pounds (103.4 tons) of SO_2
- 104,551,747.8 pounds (52,275.9 tons) of CO_2

As discussed in Section 3.4.2.2 of the DEIS, the operating Project is not anticipated to have any measureable effect on climate.

2.2.4.3 Proposed Mitigation

Except for minor, short-term impacts from construction vehicles, the Project will have no adverse impacts on air quality. Construction activities will adhere to the New York Standard and Specifications for Dust Control, and related dust control mitigation measures are as described in DEIS Section 3.4.3.

As described in Section 3.4.3 of the DEIS, the development of wind power projects can legitimately be considered a form of mitigation, in that power generated from the wind can satisfy demand that would otherwise utilize power generated by other means. While this discussion in the DEIS remains accurate, DEIS Table 12, which supports this discussion, has changed slightly due to the reduction in the number of turbines proposed. The revised table is presented as Table 9 below.

Table 9. Comparison of Air Pollutant Emissions Between Electricity Sources

Energy Source	Carbon Dioxide		Sulfur Dioxide		Nitrogen Oxides	
	Average emission rate (lbs/MWh)	Annual emissions for 209,977 MWh facility (tons/MWh)	Average emission rate (lbs/MWh)	Annual emissions for 209,977 MWh facility (tons/MWh)	Average emission rate (lbs/MWh)	Annual emissions for 209,977 MWh facility (tons/MWh)
Natural Gas	1,135	119,161.9	0.1	10.5	1.7	178.5
Coal	2,249	236,119.1	13	1364.9	6	629.9
Oil	1,672	175,540.8	12	1259.9	4	420.0
Wind	0	0	0	0	0	0

Source: EPA (2013b). *Air Emissions.* Available at: http://www.epa.gov/cleanenergy/energy-and-you/affect/air-emissions.html

2.2.5 Visual and Aesthetic Resources

2.2.5.1 Existing Conditions

The size of the Project's visual study area (defined as the area within a five-mile radius of each of the proposed turbines, and the area within a one-mile radius of the proposed transmission line) has been reduced slightly, from

190 square miles to 184 square miles, due to the reduced number of turbines proposed and the reduced length of the proposed transmission line. However, existing conditions related to visual and aesthetic resources within the visual study area for the Project (such as landscape similarity zones, viewer/user groups, and visually sensitive resources) remain essentially as described in Section 3.5 of the DEIS, and in the Visual Impact Assessment ("VIA"; edr, 2013a) (DEIS Appendix J).

2.2.5.2 Potential Impacts

2.2.5.2.1 Viewsheds and Simulations

Visual impacts during construction of the proposed Project are as described in Section 3.5.2.1 of the DEIS. Visual impacts associated with the operational Project have been slightly reduced due to the reduction in the number of turbines proposed, but are very similar to the impacts discussed in Section 3.5.2.2 and Appendix J of the DEIS. An updated viewshed analysis was prepared for the revised Project layout consistent with the methods outlined in the VIA (DEIS Appendix J). The results of the revised viewshed analysis are depicted in Figure 10 and are compared with the results of the DEIS viewshed analyses in Tables 10 and 11. While the total area (square miles) of potential Project visibility within the study area has decreased slightly with the revised layout, the size of the study area itself has also decreased, resulting in minimal change to the percentage of the study area from which turbines would be potentially visible. A more significant change is seen in the number of turbines visible. For example, the blade tip topographic viewshed of the FEIS layout indicates that approximately 53% of the study area could have views of between 37 and 48 turbines[5]. As indicated in Table 10, the blade tip topographic viewshed of the DEIS layout indicated that 37 or more turbines would be visible in approximately 61% of the study area (37-48 turbines would be visible in 9.8% of the study area and 49 to 62 turbines in an additional 51.1% of the study area). Since the currently proposed layout only consists of 47 turbines, no areas (0% of the study area) would have visibility of 49 to 62 turbines.

[5] The current layout includes 47 turbines, and consequently, there are no locations from which 48 turbines would be visible. However, to facilitate direct comparison with the impacts presented in the DEIS, the same ranges of numbers of turbines visible were used in the tables below (i.e., 0, 1-12, 13-24, 25-36, 37-48, and 49-62).

Table 10. DEIS/FEIS Viewshed Visibility Comparison based on Topography Only

Number of Turbines Visible[2]	Five-Mile-Radius Study Area[1] Viewshed Results: Topography Only							
	Blade Tip				FAA/Nacelle			
	DEIS		FEIS		DEIS		FEIS	
	Square Miles	% of Study Area	Square Miles	% of Study Area	Square Miles	% of Study Area	Square Miles	% of Study Area
0	18.2	9.9	17.0	9.6	24.7	13.4	23.7	13.3
1-12	18.1	9.8	21.9	12.3	25.6	13.9	29.1	16.4
13-24	20.1	10.9	21.7	12.2	22.5	12.2	25.5	14.3
25-36	15.8	8.5	22.8	12.8	18.0	9.8	24.7	13.9
37-48	18.0	9.8	94.4	53.1	19.6	10.6	75.0	42.1
49-62	94.2	51.1	0.0	0.0	74.0	40.1	0.0	0.0
Total Visible	184.4	100	177.9	100	184.4	100	177.9	100

[1] The five-mile-radius study area for the DEIS layout was 184.4 square miles. The five-mile-radius study area for the FEIS layout is 177.9 square miles.
[2] The current layout includes 47 turbines, and consequently, there are no locations from which 48 turbines would be visible. However, to facilitate direct comparison with the impacts presented in the DEIS, the same ranges of numbers of turbines visible were used.

Table 11. DEIS/FEIS Viewshed Visibility Comparison based on Topography and Vegetation

Number of Turbines Visible[2]	Five-Mile-Radius Study Area[1] Viewshed Results: Topography and Vegetation							
	Blade Tip				FAA/Nacelle			
	DEIS		FEIS		DEIS		FEIS	
	Square Miles	% of Study Area	Square Miles	% of Study Area	Square Miles	% of Study Area	Square Miles	% of Study Area
0	108.1	58.6	104.0	58.5	113.7	61.7	109.7	61.7
1-12	18.0	9.8	20.7	11.7	20.8	11.3	23.8	13.4
13-24	14.1	7.6	17.1	9.6	16.0	8.7	18.0	10.1
25-36	12.1	6.6	15.0	8.4	11.3	6.1	13.3	7.5
37-48	11.5	6.2	21.1	11.9	9.8	5.3	13.1	7.4
49-62	20.6	11.2	0.0	0.0	12.8	6.9	0.0	0.0
Total Visible	184.4	100	177.9	100	184.4	100	177.9	100

[1] The five-mile-radius study area for the DEIS layout was 184.4 square miles. The five-mile-radius study area for the FEIS layout is 177.9 square miles.
[2] The current layout includes 47 turbines, and consequently, there are no locations from which 48 turbines would be visible. However, to facilitate direct comparison with the impacts presented in the DEIS, the same ranges of numbers of turbines visible were used.

A viewshed analysis was not prepared for the proposed transmission line in the VIA or DEIS because of the preliminary state of the design for the transmission line, and therefore no updated viewshed analysis of the transmission line was prepared for the FEIS. However, it is anticipated that the transmission line will be visible in most portions of the study area located within approximately one mile of the proposed transmission line. This is

largely due to the agricultural setting along the transmission line route, which provides opportunities for unobstructed views across open fields. However, visibility of these components of the Project will be limited due to the distance of these facilities from public vantage points, their relatively modest height, the narrow profile of the single wooden poles, the degree to which their natural color blends with background vegetation, and screening provided by native vegetation.

To further evaluate the degree to which the reduced number of turbines and current transmission line design many affect the visual impact of the Project, seven of the fifteen visual simulations included in the DEIS were updated to reflect the revised Project layout. These seven simulations (five of which feature the proposed wind turbines and two of which feature the proposed transmission line) were selected because they featured views of the Project where there was the highest likelihood of a meaningful change in the overall visual effect resulting from the revised layout (i.e., the remaining views shown in the DEIS will not be significantly changed with the revised layout). The techniques used in preparing the revised simulations are as described in the VIA (DEIS Appendix J). The revised simulations are presented in Appendix A as three-sheet figures, each showing 1) a view of the existing conditions, 2) a view of the previously proposed DEIS layout, and 3) a view of the proposed FEIS Layout. Differences in Project appearance and visibility from each of these viewpoints are summarized below:

- Viewpoint 17: Copenhagen Central School – The most noticeable change to the proposed view from this location is a shift in location of one of the more visually prominent turbines. There is also one less turbine visible from this viewpoint as compared to the DEIS layout. Nonetheless, the overall visual effect at this location is essentially unchanged.
- Viewpoint 86: NYS Route 12, Copenhagen – Nine turbines, arranged in two rows, were visible in the simulation of the DEIS layout. The presently proposed turbine layout eliminates the row of five turbines located further from the viewer, with the four turbines closer to the viewer remaining. The cluttering effect of multiple strings of turbines at various distances from the viewer is reduced in the view of the FEIS layout compared to the view of the DEIS layout from this viewpoint.
- Viewpoint 96: Porter Road, Maple Ridge Wind Farm – The number of turbines in the background along the horizon is reduced in the FEIS layout compared to the DEIS layout, and the turbines are spaced further apart. As stated in the VIA, the visual impact of the proposed turbines was already diminished from this vantage point due to the fact that the existing Maple Ridge wind turbines are located closer to the viewer and dominate the view. The reduced number of proposed turbines visible along the horizon in the view of the FEIS layout further minimizes the visual impact of the Copenhagen Wind Farm in this view.
- Viewpoint 125: Cook Road – With the revised Project layout, five turbines visible from this viewpoint have been eliminated. The visual impact of the DEIS layout was described as minimal in the VIA, and is further

minimized with the FEIS layout, due to the even spacing of fewer turbines compared to a larger number of turbines clustered closer together.

- Viewpoint 200: NYS Route 126 – Fewer turbines are visible from this viewpoint with the FEIS layout in place, however, the turbines still extend across the entire ridge in the view and the visual impact is essentially unchanged.
- Viewpoint 140: Switzer Road – There is a slight shift in the location of one of the transmission line poles featured in the view. The overall visual effect at this location is essentially unchanged.
- Viewpoint 141: Switzer Road – The two transmission line poles featured in the foreground in this view are shifted slightly further away from the viewer. The overall visual effect at this location is remains essentially the same as shown in the DEIS.

In conclusion, the revised viewshed analyses and simulations indicate that changes to the turbine layout since the release of the DEIS have reduced the number of turbines visible, and thereby reduced the visual impact. However, this reduction is relatively minor, and the visual impact from most areas is essentially unchanged. The revised design of the transmission line, because it is approximately 1.0 miles shorter than the line evaluated in the DEIS, likely reduces the area from which it will be visible. However, in the areas where the transmission line will still be visible, the overall visual effect of the proposed line remains the same as presented in the DEIS.

2.2.5.2.2 Shadow Flicker Impacts

An updated shadow flicker analysis was prepared for the revised Project layout (EDR, 2013; see Appendix F). As in the original analysis, resident receptors within 1,000 meters of a proposed turbine (i.e., those that could potentially perceive shadow flicker) were identified. These included 118 residential structures (as opposed to the 123 receptors evaluated for the DEIS analysis), which are identified on Figure 2 in Appendix F. The analysis was prepared in accordance with the methods and assumptions outlined in Section 3.5.2.2.5 and Appendix K of the DEIS. A comparison of the projected shadow flicker at receptors located within 1,000 meters of a proposed turbine site for the DEIS and FEIS layouts is presented in Table 12.

Table 12. DEIS/FEIS Shadow Flicker Effects Comparison

Predicted Shadow Flicker	DEIS Layout 62 turbines 123 receptors within 1,000 meters of turbines		FEIS Layout 47 turbines 118 receptors within 1,000 meters of turbines	
	Receptors (count)	% of Receptors	Receptors (count)	% of Receptors
0 hours	45	37%	27	23%
0-1 hour/year	1	1%	1	<1%
1-10 hours/year	39	39%	46	39%
10-25 hours/year	35	29%	40	34%
25-40 hours/year	2	2%	3	3%
40+ hours/year	1	1%	1	<1%

Of the 118 receptors within 1,000 meters of a currently proposed turbine, there are four (3%) that are predicted to exceed 25 hours of shadow flicker per year. A threshold of 25 hours per year was established in the Sections 3.5 and Appendix K of the DEIS as the level of impact for requiring additional analysis and possible mitigation measures. Moreover, a standard of 25 to 30 hours of shadow flicker per year is generally accepted as an industry baseline in the United States. The details regarding anticipated shadow flicker at each of the structures where shadow flicker is predicted to exceed 25 hours per year are summarized below in Table 13. Of these four receptors, three are Project participants (one of which [Receptor 147] is a sugar shack rather than a residence). Therefore, only one non-participating residential receptor (Receptor 70) is predicted to exceed the 25-hour per year threshold. Shadow flicker effects will be experienced at Receptor 70 a maximum of 201 days per year (202 days were predicted in the DEIS). The maximum amount of shadow flicker modeled for a single day at Receptor 70 is 49 minutes per day (47 minutes per day were predicted in the DEIS).

Table 13. Structures Exceeding 25 Hours of Shadow Flicker per Year

Receptor ID	Project Status	Predicted Shadow Flicker (hh:mm/year)	Turbines Contributing Shadow Flicker	Approximate Times of Day Receptor Potentially Affected by Flicker
154	participant	32:44	35, 36, 37, 38	1:30 – 2:15 PM 4:00 – 8:00 PM
70	non-participant	34:58	38, 39, 40	3:00 – 4:45 PM 5:45 – 6:45 PM 7:15 – 8:00 PM
7	participant	38:24	48	6:00 – 7:00 PM
147	participant (sugar shack)	52:50	12, 13, 14	2:15 – 4:45 PM 6:45 – 8:30 PM

Relative to the shadow flicker results presented in the DEIS, the revised Project layout will result in an increase from three to four receptors that could potentially experience shadow flicker more than 25 hours per year. As indicated above, only one of these receptors is not a Project participant, and this receptor was the only non-participant predicted to receive greater than 25 hours/year of shadow flicker in the DEIS. In addition, the estimated maximum amount of shadow flicker at any receptor (the non-residential sugar shack of a Project participant) increased from approximately 42.5 to 53 hours per year.

As described in the DEIS, the predicted shadow flicker calculations do not take into account the actual location and orientation of windows, or the screening effects associated with existing site-specific conditions and obstacles such as vegetation and/or buildings. Based on aerial photo interpretation, it appears that tall vegetation and/or buildings located between the contributing turbines and these receptors may reduce the amount of shadow flicker experienced at the receptor locations. Further, this analysis assumes the turbine rotor is continuously in motion, which in reality is not the case. Given these conservative assumptions, the predicted shadow-flicker impacts are likely overstated. In addition, many of the modeled shadow flicker hours are expected to be of low intensity, as they would occur during the early morning or late afternoon hours when the sun is low in the sky. As the sun sinks below the horizon, more of its light is scattered by the atmosphere, which has the effect of dampening its brightness and therefore reducing its ability to cast dark shadows.

2.2.5.3 Proposed Mitigation

The anticipated impacts are significantly less than indicated in the DEIS because the FEIS analysis is based on the 47 turbines actually proposed rather than the 62 potential sites evaluated in the DEIS. Project downsizing is a form of mitigation of visual impacts that was identified in Section 3.5.3 of the DEIS. Additional measures that have been taken so far and that will be taken in the future to minimize and mitigate for visual impacts are as described in Section 3.5.3 of the DEIS.

Mitigation measures to reduce the impact of shadow flicker on sensitive receptors are also discussed in Section 3.5.3 of the DEIS. The Project Sponsor will communicate directly with the single non-participating landowner predicted to receive greater than 25 hours of shadow flicker per year to discuss potential impacts and mitigation options. It should also be noted that complaints regarding shadow flicker that cannot be resolved utilizing mitigation measures described in the DEIS may be addressed by using the Project's SCADA system to control the operation of specific turbines contributing to the impact. In addition, the Project Sponsor will implement a Complaint Resolution Plan to establish an efficient process by which to report and resolve any construction or operational impacts, including potential shadow flicker impacts (see Appendix G for the Complain Resolution Procedure).

2.2.6 Historic, Cultural and Archeological Resources

2.2.6.1 Existing Conditions

The DEIS included a Phase 1A Cultural Resources Survey (edr, 2013b; see DEIS Appendix L) for the Project. The Phase 1A survey included an inventory of previously identified cultural resources (archeological sites and historic structures/properties) in the area that may be affected by the proposed Project, and evaluated the potential for previously unidentified cultural resources to be located in the Project's area of potential effect (APE). The Phase 1A report recommended that additional (Phase 1B) studies be conducted to determine if previously unidentified cultural resources are located in the Project APE. The Phase 1A report was submitted to the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP) on March 7, 2013 for their review and comment. NYSOPRHP provided a response letter dated June 5, 2013 (see Appendix A of FEIS Appendix I) indicating NYSOPRHP's concurrence with the conclusions and recommendations presented in the Phase 1A report.

The results and findings of the subsequent (Phase 1B) cultural resources studies for the Project are summarized below. The Phase 1B studies included a Phase 1B Archeological Survey (EDR, 2014b; FEIS Appendix H) and Historic Resources Survey (EDR, 2014c; FEIS Appendix I). Both of these studies were conducted in accordance with the *New York State Historic Preservation Office Guidelines for Wind Farm Development Cultural Resources Survey Work* (the *SHPO Wind Guidelines;* NYSOPRHP, 2006). Per the *SHPO Wind Guidelines*, work plans that detailed the scope of work for each survey were submitted to NYSOPRHP for review and comment prior to undertaking the surveys. A work plan for the Phase 1B Archeological Survey was submitted to NYSOPRHP on August 29, 2013. NYSOPRHP provided a letter on September 18, 2013 (the Work Plan is included as Appendix B of FEIS Appendix H). In correspondence dated September 18, 2013, NYSOPRHP concurred with the recommendations presented in the Phase 1B Archeological Survey work plan. In addition, a work plan for the Historic Resources Survey was submitted to NYSOPRHP on July 3, 2013. On August 19, 2013, EDR submitted a memorandum to NYSOPRHP that presented the results of the historic resources survey for the area within one-mile of the proposed turbines. On September 12, 2013, EDR and Copenhagen Wind, LLC met with NYSOPRHP staff to review the materials (described above) that had been submitted to NYSOPRHP regarding the Project. During the meeting, NYSOPRHP provided concurrence with the approach for the Historic Resources Survey (see Section 2.2 of FEIS Appendix I).

2.2.6.1.1 Archeological Resources

A Phase 1B Archeological Survey was conducted between June and November, 2013 to assess the potential impact to archeological resources located within the Project's APE (EDR, 2014b; see FEIS Appendix H). Archeological survey fieldwork was conducted within the limits of proposed disturbance for the Project, which included pedestrian surface survey in actively cultivated areas where ground surface visibility exceeded 70% (per NYSOPRHP's *Phase 1 Archeological Report Format Requirements* [NYSOPRHP, 2005]) and the completion of shovel tests in areas where ground surface visibility did not exceed 70% (i.e., forested, idle/successional, hay fields, and lawn areas). The SHPO *Wind Guidelines* (NYSOPRHP, 2006) call for the intensive archeological testing (i.e., completion of shovel tests at a 5-meter interval) within limited sample areas distributed throughout the various landscape types intersected by the Project APE. The methodology and research design for the Phase 1B archeological survey are more fully described in Appendix H. In total, the Phase 1B survey included the excavation of 3,425 shovel tests and pedestrian survey of approximately 402 acres.

The Phase 1B archeological survey resulted in the identification of one pre-contact (Native American) and nine historic-period archeological sites within the Project site. The one pre-contact (Native American) site identified within the Project site consists of a single, isolated, ground-stone bifacial tool that is typically referred to as a "celt", which was recovered during the course of pedestrian survey of the proposed access road between turbines 55 and 56. The tool is made of a very fine-grained and dense shale or siltstone and has been largely modified on the broader end, with one surface bearing a steeper-angled bevel in comparison to the opposite surface that bears a more gradual and evenly formed bevel. Following the discovery of the tool, a more intensive archeological survey of the surrounding area was conducted, including pedestrian survey of the surrounding area and excavation of 60 shovel tests. No additional pre-contact artifacts or materials were identified in the area, indicating that the artifact is an isolated find and not indicative of a larger, previously unidentified pre-contact archeological site. The nine historic-period archeological sites identified within the Project site include artifact scatters and/or structural remains (foundations) associated with nineteenth and/or twentieth-century residences, farmsteads, and agricultural outbuildings (e.g., sap houses/sugar shacks).

2.2.6.1.2 Historic-Architectural Resources

As described in the DEIS, historically significant properties include buildings, districts, objects, structures and/or sites listed, or that NYSOPRHP has formally determined are eligible for listing, on the State and/or National Register of Historic Places (NRHP). Criteria set forth by the National Park Service for evaluating historic properties (36 CFR 60.4) state that a historic building, district, object, structure or site is significant (i.e., eligible for listing on the NRHP) if the property conveys: "The quality of significance in American history, architecture, archeology, engineering, and

culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or (d) that have yielded, or may be likely to yield, information important in prehistory or history" (CFR, 2004a; NPS, 1990).

Per the *SHPO Wind Guidelines*, the APE for visual impacts on historic properties for wind projects is defined as those areas within five miles of proposed turbines which are within the potential viewshed (based on topography only) of the project (NYSOPRHP, 2006). The Project APE also includes those areas located within one mile of the proposed overhead transmission line for the Project. The background, methods, and criteria for the identification of significant historic resources is more fully described in the Project's Historic Resources Survey report (EDR, 2014c; Appendix I). A total of 88 resources located within the APE were inventoried as part of the historic resources survey. The results of the survey are summarized as follows:

- One property (the Hiram Hubbard House) listed on the National Register of Historic Places (NRHP) is located within the APE.
- There are 57 properties located within the APE that were recommended NRHP-eligible in the Historic Resources Survey report (note that 14 of these are properties that have been previously determined eligible by NYSOPRHP, 11 properties were previously included in NYSOPRHP's State Preservation Historical Information Network Exchange [SPHINX] database but were not formally evaluated for NRHP-eligibility, 31 are newly identified by EDR, and one was formerly determined not eligible by NRHP).
- There are 25 additional properties within the APE that were formerly determined NRHP-eligible that EDR is recommending are not NRHP-eligible and five properties that were formerly determined NRHP-eligible that are now demolished.

It is worth noting that 13 of the 58 historic resources in the study area that are NRHP-listed or recommended NRHP-eligible by EDR are early nineteenth century limestone buildings located in the Towns of Denmark and Champion (see Section 3.2 and Appendix B in FEIS Appendix I). Though some of these stone buildings display alterations to their materials and form, all are historically significant for their construction methods and materials. In addition, in some cases, association with persons important to settlement and early industry in Jefferson and Lewis Counties contributes to the historic significance of the properties. Several of these buildings were previously profiled as part of

the "Old Houses of the North Country" series of newspaper articles, written by David F. Lane and published in the *Watertown Daily Times* from 1941-1956.

2.2.6.2 Potential Impacts

2.2.6.2.1 Archeological Resources

As described in the DEIS, proposed construction of the Project will include ground disturbing activities that have the potential to impact archaeological resources. The Phase 1B Archeological Survey resulted in the identification of 10 archeological sites within the Project site. Of these, five were located within (or adjacent to) the Project APE (i.e., the locations of proposed Project facilities) and five were located in areas where no ground disturbance is proposed. One of the sites located within the Project APE is an isolated find (i.e., a single artifact), a pre-contact (Native American) stone tool (referred to as a celt, similar to an axe). No other artifacts were found in association with this find and the site is not considered to be archeologically significant. The remaining four sites within or adjacent to the APE are historic-period archeological sites (i.e., artifact scatters and/or structural remains associated with nineteenth/twentieth-century residences or farmsteads). Each of these sites is located adjacent to the proposed location of a proposed access road and/or buried interconnect (per the Project design at the time of the archeological survey). Following the survey, the Project layout was revised to move the locations of proposed facilities away from the identified archeological sites. Consequently, impacts to archeological resources will be avoided during Project construction.

NYSOPRHP provided comments on the Phase 1B Survey Report (Appendix H) in review correspondence dated March 31, 2014 (NYSOPRHP, 2014a; see Appendix N). The review correspondence indicated concurrence with the findings and conclusions presented in the Phase 1B report and indicated that NYSOPRHP "has no further concerns regarding archeological resources within the project area" (NYSOPRHP, 2014a; see Appendix N).

As stated in the DEIS, once the proposed Copenhagen Wind Farm has been constructed, no significant earth-disturbing activities associated with operation and maintenance of the Project will occur. Therefore, Project operation will not have an adverse effect on archeological resources.

2.2.6.2.2 Historic-Architectural Resources

Construction of the Project will not require the demolition or physical alteration of any buildings or other potential historic resources. No direct physical impacts to historic-architectural resources will occur as a result of the Project.

As described in the DEIS, the Project's potential effect on a given historic property would be a change (resulting from the introduction of wind turbines) in the property's visual setting (CFR, 2004b), if turbines are visible when the historic property is viewed from a publicly accessible vantage point. The potential effect of the Project on the visual setting associated with historic resources is highly variable, and is dependent on a number of factors including the distance to the Project, the number of visible turbines, the extent to which the Project is screened or partially screened by buildings, trees, or other objects, and the amount of existing visual clutter and/or modern intrusions in the view. It is also worth noting that visual setting may or may not be an important factor contributing to a given property's historical significance. Scenic views and/or association with the landscape are not specifically identified as contributing to the significance of any of the historic resources in the study area. The potential visibility and visual effect of the Project on historic resources within the study area is fully considered in FEIS Appendix I, and summarized below.

Consideration of the screening effects of both topography and mapped forest vegetation in the viewshed analyses (i.e., the vegetation viewshed analysis) indicates that views of the Project will be completely screened from the only NRHP-listed site in the APE and 14 of the 57 properties recommended in the survey to be NRHP-eligible. However, the vegetation viewshed analysis does not take into account screening that would be provided by buildings, street trees, yard vegetation, or other objects that could screen views of the Project from many locations (especially in urban, village, and hamlet settings). In addition, characteristics of the proposed turbines that influence visibility (color, narrow profile, distance from viewer, etc.), are not taken consideration in the viewshed analyses, so actual visibility of the Project is expected to be significantly less than indicated by viewshed mapping.

In general, the scale and character of the wind turbines will result in a more significant effect on the setting associated with historic resources located in close proximity to the Project (i.e., within approximately two miles) and will generally result in less significant effects on properties where the turbines are features in the distant mid-ground or background of the view. There are 25 properties that are recommended NRHP-eligible located between 0.5-mile and two miles from the Project (i.e., where the Project, if visible, would be a feature in the near mid-ground of the view of and from these resources). The potential visual effect of the Project on the setting associated with these properties is greater relative to other resources in the APE due to the proximity and perceived scale of the turbines. However, the actual visibility of the Project from these resources varies in terms of the number of turbines potentially visible and the extent of existing screening present at each site. In general, the visual effect of the Project will be more significant from locations with open views of the Project. Of the 25 identified historic resources with potential near mid-ground views of the Project, 11 are located in the Village of Copenhagen and eight are located in or near the hamlet of Denmark. In general, open views towards the Project are less frequent in developed areas due to the extent of screening provided by existing buildings, vegetation, and other objects. In many locations, views of the

Project will be limited to occasional, partially screened view where portions of single (or relatively few) turbines (or turbine blades) will be visible in the gaps between existing buildings and yard vegetation.

More distant mid-ground views of the Project (i.e., between 2.0 and 3.5 miles) will be potentially available from 13 historic resources. Views of the Project will be completely screened from nine of these 13 properties (including the Hiram Hubbard House). The potential effect of the Project on the visual setting associated with the other four resources located between two and 3.5 miles from the turbines resources will generally be less than for resources located closer to the Project. The remaining 20 historic resources within the APE that are recommending NRHP-eligible are located greater than 3.5 miles from the Project, where proposed turbines would be features in the background of the view from these resources. Views of the turbines will be completely screened from five of these historic resources. Although the Project will be visible from the remaining 15 resources, because of the effect of distance the proposed turbines are not anticipated to be prominent features in the view from these areas and will not significantly affect the visual setting associated with historic resources located more than 3.5 miles from the Project.

It is worth noting that visibility of a project does not necessarily indicate that an adverse effect will occur. The New York State Department of Environmental Conservation (NYSDEC) guidance concerning visual impacts on aesthetic resources of statewide significance (which include NRHP-listed and NRHP-eligible structures) defines significant aesthetic impacts as those "that may cause a diminishment of the public enjoyment and appreciation of an inventoried resources, or one that impairs the character or quality of such a place… Mere visibility, even startling visibility of a project proposal, should not be a threshold for decision making. Instead a project, by virtue of its visibility, must clearly interfere with or reduce the public's enjoyment and/or appreciation of the appearance of an inventoried resource" (NYSDEC, 2000:5). In addition, visual setting may not be an important factor contributing to a given property's historical significance. For instance, in most cases, rural residential and farmstead properties in New York are determined NRHP-eligible under NRHP Criterion C (i.e., they "embody the distinctive characteristics of a type, period, or method of construction" [CFR, 2004a]). These properties are typically determined NRHP-eligible because they are representative examples of vernacular nineteenth-century architectural styles that retain their overall integrity of design and materials. These properties would retain the characteristics that caused them to be recommended eligible after the introduction of wind turbines and/or a transmission line into their visual settings. For these types of resources, the potential change in the setting resulting from the Project will not necessarily result in diminished public enjoyment and appreciation of a given historic property, or impair its character or quality (per NYSDEC, 2000, see above).

In addition (as noted previously), there are 25 properties within the APE that were formerly determined NRHP-eligible that were evaluated in the Historic Resources Survey and are being recommended not NRHP-eligible and five

properties that were formerly determined NRHP-eligible that are now demolished. Due to the condition and/or integrity of these properties, they are not considered architecturally or historically significant, and therefore the visual effect of the Project on their visual setting is not considered a significant impact on historic resources.

NYSOPRHP provided comments on the Historic Resources Survey (Appendix I) in review correspondence dated March 20, 2014 (NYSOPRHP, 2014b; see Appendix N). The review correspondence indicated concurrence with the findings and NRHP-eligibility evaluations presented in the Historic Resources Survey and indicated that the Project will have an adverse effect on historic resources due to visual effects on the setting associated with those resources. NYSOPRHP concluded that "the introduction of 492 foot kinetic structures into the existing rural landscape of this community does indeed alter the environment of these resources and introduces visual elements that are incongruous to agrarian nature of this area and the involved historic resources" (NYSOPRHP, 2014b; see Appendix N).

2.2.6.3 Proposed Mitigation

2.2.6.3.1 Archeological Resources

Following completion of the Phase 1B archeological survey, minor modifications to the Project layout were made to avoid any impacts to archeological resources. The locations of proposed Project components (access roads and/or interconnects) that intersected or were located adjacent to identified archeological sites (i.e., within 100 feet) were revised and relocated away from the archeological sites. As previously noted, the archeological survey work for the Project was conducted in accordance with the SHPO *Wind Guidelines* (NYSOPRHP, 2006), which specify an archeological testing methodology that intensively samples selected areas within the larger Project area. The amount of archeological survey work conducted (i.e., the number of shovel tests excavated) was determined based on the total area of proposed ground disturbance (archeological APE) at the time that the archeological work was conducted. The SHPO *Wind Guidelines* are based on the assumption that additional archeological survey work is not necessary if project components move around during the project development process, as long as the total area of ground disturbance for the project does not increase (NYSOPRHP, 2006). As described in Table 3, revisions to the Project layout have resulted in a reduction in the total area of proposed ground disturbance relative to the Project layout that was evaluated in the DEIS. Consequently, the archeological survey work associated with the DEIS Project layout adequately covers the FEIS Project layout's archeological APE and no additional archeological survey work is required. As noted above, NYSOPRHP has indicated they have no additional concerns regarding archeological resources within the Project site (NYSOPRHP, 2014a; see Appendix N).

To minimize the likelihood that any unanticipated impacts to archeological sites occur as a result on subsequent layout changes or construction activities, the mapped locations of identified archeological sites will be included on Project construction maps surrounded by a 100-foot (minimum) buffer, identified as "Environmentally Sensitive Areas" or similar, and marked in the field by construction fencing with signs that restrict access. These measures should be adequate to insure that impacts to archeological resources are avoided. As indicated in the DEIS, in the event that unanticipated archeological resources are encountered during construction, the Environmental Monitor will stop all work in the vicinity of the archeological finds until those resources can be evaluated and documented by a Registered Professional Archeologist.

2.2.6.3.2 Historic-Architectural Resources

As described in Section 2.2.5 of this FEIS, visual impacts associated with the operational Project have been reduced somewhat due to the reduction in the number of turbines proposed (relative to the Project proposed in the DEIS). In addition, it is worth noting that wind turbines from the Maple Ridge Wind Farm are established existing features of the landscape within the visual APE. The Maple Ridge Wind Farm is a 321 MW wind energy facility that includes 195 turbines located in the towns of Lowville, Martinsburg, and Harrisburg in Lewis County. This facility is located approximately 2.4 miles southeast of the Copenhagen Wind Farm Project. Because the Maple Ridge Wind Farm has been in operation since 2006, the appearance and visual effect of wind turbines are generally familiar and accepted components of the landscape within the visual study area for the Copenhagen Wind Farm. The presence of existing wind turbines in the visual setting of many of the historic resources in the study area helps to minimize the potential visual effect of the proposed Project.

As described above, in correspondence date March 20, 2014, NYSOPRHP concluded that the Project will have an adverse effect on historic resources due to the introduction of wind turbines into the visual setting associated with historic resources (NYSOPRHP, 2014b; see Appendix N). In addition, NYSOPRHP noted that the reduction in the number of proposed turbines from 62 to 47 turbines "is a significant component in minimizing the overall impact of the project on the historic resources. As such, absent other state or federal agency involvement, we would support the Lead Agency now moving to establish appropriate mitigation programs to offset the loss of historic setting associated with the identified resources. Generally our office recommends that such mitigation:

- Be focused on a project or projects linked to the historical/architectural or archaeological [resources] significant of the involved communities.
- Be designed to have the greatest benefit to the largest number of community residents. In most cases means the work should involve public spaces/properties (historic town hall, historical societies/local house museums etc.) if practicable rather than privately owned resources.

- Be able to be completed within the funding established though any mitigation program and with dedicated local commitments of resources as needed.
- Follow accepted and approved preservation practices and is undertaken in consultation with the State Historic Preservation Office" (NYSOPRHP, 2014b).

Mitigation options are limited, given the nature of the Project and its siting criteria (very tall structures typically located in open fields at the highest locally available elevations). Mitigation for impacts to historic properties therefore typically consists of projects that benefit historic properties and/or the public's appreciation of historic resources to offset potential impacts to historic properties resulting from the introduction of wind turbines into their visual setting. Mitigation projects that have been proposed for other wind energy projects in New York State have included activities such as additional historic resources surveys, NRHP nominations, monetary contributions to historic property restoration causes, development of heritage tourism promotional materials, development of educational materials and lesson plans, and development of public history materials, such as roadside markers. Potential mitigation projects would need to be defined and developed in consultation with the Lead Agency and NYSOPRHP.

A not-for-profit advocacy group based in the Village of Copenhagen called WinDenmark provides an established local mechanism for financially supporting projects that benefit the community, including historic preservation projects. Copenhagen Wind will work with WinDenmark and representatives of the Town of Denmark and Village of Copenhagen to identify appropriate projects that could receive funding/sponsorship from the Applicant. Types of mitigation projects that could be considered for this Project include the following:

- Support façade improvements in the Village of Copenhagen. Although many of the individual properties in Copenhagen do not retain sufficient integrity of form and materials to be considered NRHP-eligible, the overall layout, form, massing, and spacing of buildings contribute to the historic feeling and setting within the Village. Façade improvements appropriate to the age, style, and character of structures in Copenhagen would improve the general aesthetics and historic character of the Village. It is anticipated that WinDenmark would administer the funding for and facilitate the improvement projects including selecting consultants and contractors and providing their insight and expertise as long-time residents of the community.
- Prepare a "Stone Houses of the North Country" Multiple Property Document (MPDF) and NRHP nominations for eligible properties. These nominations would provide a mechanism for these properties to be listed on the NRHP, which allows property owners to access state and federal tax credit programs that financially support the repair and maintenance of historic properties.

- Sponsor a workshop (or series of workshops) to educate and assist owners of NRHP-listed and NRHP-eligible properties in the study area to understand the benefits of NRHP listing and assist with applications for historic preservation tax credits to offset/support owners' improvements to their properties.
- Support the development of local history curriculum and educational materials for use public schools within the study area. This is also a project that would be ideal for WinDenmark to support and facilitate.

2.2.7 Sound

An Environmental Sound Survey and Noise Impact Assessment was prepared by Hessler Associates, Inc. (Hessler) in support of the DEIS (see Section 3.7 and Appendix M of the DEIS). In support of this FEIS, Hessler performed a Noise Model Update to assess potential noise impacts anticipated to result from the revised Project layout (Appendix J of this FEIS).

2.2.7.1 Existing Conditions

Section 3.7.1 of the DEIS defines the measurable properties of sound and describes the methodology and results of the background sound level survey conducted by Hessler. As described therein, the background noise level in the study area during the worst-case scenario wind speed of 7 meters per second (the wind speed at which there is the greatest contrast between background noise and Project noise) is 35 dBA.

2.2.7.2 Potential Impacts

Construction of wind power projects requires the operation of heavy equipment and construction vehicles for various activities including construction of access roads, excavation and pouring of foundations, the installation of buried and above ground electrical interconnects, and the erection of turbine components. Potential sound impacts from construction are described in Section 3.7.2.1 of the DEIS. Sound levels generated during different phases of construction are presented in Table 20 of the DEIS.

Noise impacts associated with the operating Project are similar to what was expected at the time of the DEIS. Although the revised layout includes 15 fewer turbines, the 1.7 MW turbine model currently proposed has a somewhat higher sound level output (107 dBA vs. 105 dBA). The increase in sound levels is due to the blades rotating faster (16.4 revolutions per minute [rpm] for the 1.7 MW model vs. 15.3 rpm for the 1.6 MW model). The results of Hessler's updated noise model are mapped on Plot 1 of Appendix J. One hundred three (103) residences are currently anticipated to experience noise levels in the range of 40-45 dBA, while six residences are anticipated to experience sound levels exceeding 45 dBA. All six of these residences belong to Project participants; there are no non-participating residences expected to experience sound levels above 45 dBA. As stated in the noise model

update letter from Hessler (see Appendix J), the conclusions expressed in the original noise assessment "generally remain unchanged and valid. It should be added, however, that the elimination of a string of five units [turbines] at the western end of the Project along Hayes Road will greatly reduce Project-related sound levels" in that area.

See Section 3.7.2 and Appendix M of the DEIS for further detail on the methodology and assumptions used to model potential noise impacts, as well as a discussion indicating that no impacts related to low frequency noise are anticipated.

2.2.7.3 Proposed Mitigation

As indicated in the DEIS, the Town of Denmark's Zoning Law requires that the Project operate so that the maximum noise generated does not exceed 45 dBA at distances beyond 1,250 feet from the turbine, except where allowed by waiver. However, this standard is unclear, in that it doesn't provide an appropriate measurement of impact. Standard sound assessment protocols, such as the NYSDEC Program Policy *Assessing and Mitigating Noise Impacts*, evaluate sound levels and associated impact at specific receptors, typically residences. Since the Town of Denmark Zoning Law does not identify receptors, the Project sound analysis focuses on assessing and mitigating impacts to residences, particularly non-participating residences. The Zoning Law standard has been applied to all non-participating residences in the Project area, since all are located greater than 1,250 feet from a turbine. As indicated above in Section 2.2.7.2, there are no non-participating residences expected to experience sound levels above 45 dBA. The Project Sponsor is committed to working with the Planning Board during the site plan review to address the noise standard in the Zoning Law.

Other mitigation measures for potential adverse impacts associated with the construction and operation of the redesigned Project are as described in Section 3.7.3 of the DEIS. See also Appendix G, for a copy of the Complaint Resolution Plan.

2.2.8 Traffic and Transportation

Information regarding traffic and transportation provided in Section 3.8 of the DEIS generally remains accurate. However, the reduction in the number of proposed turbines and length of the overhead transmission line will result in a minor reduction of potential traffic and transportation impacts during construction and operation of the Project.

2.2.8.1 Existing Conditions

The information regarding existing roads and traffic conditions provided in Section 3.8.1 of the DEIS has not changed.

2.2.8.2 Potential Impacts

Information regarding the type of potential transportation and traffic impacts provided in Section 3.8.2 of the DEIS remains accurate and is largely unaffected by the Project adjustments that have occurred. An updated Traffic and Transportation Study was not conducted because the delivery routes are anticipated to be the same. The only change in anticipated impacts is that there will be fewer curb cuts on public roads to accommodate Project access roads, and the total volume of material deliveries (gravel, concrete, turbine components, etc.) and vehicles carrying workers will be reduced with the smaller number of turbines proposed. This reduction will primarily affect construction-related traffic. Traffic and transportation impacts associated with Project operation will be largely unchanged. Therefore, potential impacts are expected to be the same or reduced due to the reduced number of turbines in the Project.

2.2.8.3 Proposed Mitigation

Proposed mitigation, as described in Section 3.8.3 of the DEIS, has not been affected by the Project adjustments that have occurred. Because traffic and transportation impacts are anticipated to be the same or reduced, no new mitigation is proposed.

2.2.9 Socioeconomics

The only changes in socioeconomic conditions, from those described in the DEIS, are related to the reduced number of turbines currently proposed. How this reduction changes the Project's potential socioeconomic impacts, in comparison to those described in the DEIS, is discussed below in Section 2.2.9.2.

2.2.9.1 Existing Conditions

The existing conditions of the Project area are unchanged in terms of economy and employment, population and housing, and municipal budgets and taxes, and are consistent with the description provided in Section 3.9.1 of the DEIS.

2.2.9.2 Potential Impacts

The discussion in DEIS Section 3.9.2 of the Project's potential socioeconomic impacts is largely still applicable. However, the JEDI model was rerun to using the updated project details (47 turbines sized at 1.7 MW each, for a total nameplate capacity of 79.9 MW [total capacity same as in DEIS] to be constructed in 2014) and with outputs in 2013 dollars (as opposed to 2012 dollars). This updated analysis resulted in slight increases in the level of

employment, employee earnings, and economic output of the affected businesses. The results are shown below in Table 14.

Table 14. Projected Economic Impacts

	Jobs	Earnings[1] (millions)	Output[1] (millions)
During Construction Period			
Project Development and Onsite Labor Impacts	62	$4.2	$4.6
Construction and Interconnection Labor	59	$3.7	
Construction Related Services	4	$0.5	
Turbine and Supply Chain Impacts	191	$13.4	$34.8
Induced Impacts	54	$3.9	$10.2
Total Construction Impacts	307	$21.6	$49.6
During Operating Years (Annual)			
Onsite Labor Impacts	5	$0.4	$0.4
Local Revenue and Supply Chain Impacts	4	$0.3	$1.6
Induced Impacts	4	$0.3	$0.7
Total Impacts	13	$1.0	$2.6

Source: National Renewable Energy Laboratory Jobs and Economic Development (JEDI) Model Version W1.10.02

[1] Earnings and Output figures are in 2013 dollars. Results are based on model default parameters. Figures may not add up due to independent rounding.

As indicated in Table 14, the updated JEDI analysis predicts that the Project as currently proposed will create 62 on-site construction jobs. In addition, the off-site industries within New York State that supply goods and services for the construction of the facility could experience increased employment demand of a projected 191 workers. Furthermore, the increased household income associated with both on- and off-site employment could induce demand for at least 54 jobs, as construction and supply chain workers spend their earnings on everyday household goods and services. In sum, it is estimated that the on-site, supply chain and induced jobs could generate $21.6 million in earnings over the course of facility construction.

In addition to jobs and earnings, the construction of the Project as currently proposed could result in an increase in economic output for the businesses employing these workers. Output is measured by the value of industry production in the state or local economy. For the manufacturing sector, output is calculated by total sales plus or minus changes in inventory. For the retail sector, output is equal to gross profit margin. For the service sector, it is equal to sales volume. It is now estimated that Project construction could result in an economic output of approximately $49 million, between on-site construction, supply chain impacts, and increased household spending.

2.2.9.3 Proposed Mitigation

Changes in predicted socioeconomic impact are not of a type or magnitude that would require changes in proposed mitigation. Section 3.9.3 of the DEIS still accurately describes proposed mitigation of socioeconomic effects.

2.2.10 Public Safety

This section addresses concerns regarding public safety associated with the proposed Project. Any supplemental information as a result of the reduced/redesigned Project is discussed below.

2.2.10.1 Background Information

Background information regarding public safety issues including ice shedding, tower collapse/blade throw, stray voltage, fire, lightning strikes, electrocution, and electro-magnetic fields are described in section 3.10.1 of the DEIS. Project revisions and additional information available on the Project do not alter the background information presented in the DEIS.

2.2.10.2 Potential Impacts

2.2.10.2.1 Construction

The potential impacts to public safety related to construction of the proposed Project are essentiailly unchanged from the discussion presented in Section 3.10.2.1 of the DEIS. However, the risk of a public safety related impact is slightly reduced due to the reduced number of wind turbines proposed. Due to the reduced number of turbines, length of access roads, etc., risk of public exposure to construction-related hazards (e.g., the passage of large construction equipment to, from, and within the work site) has proportionally decreased. In addition, because Project construction activities will occur primarily on private land, and would be well removed from adjacent roads and residences, exposure of the general public to construction-related risks/hazard is expected to be very limited, and will be minimized by appropriate signage, warning the general public of the ongoing construction activities.

2.2.10.2.2 Operation

The potential impacts to public safety related to operation of the proposed Project are essentially unchanged from the discussion presented in Section 3.10.2.2 of the DEIS. However, due to the proposed use of fewer turbines than presented in the DEIS, turbine locations (and associated setbacks from non-participating parcel lines, public roads, etc.) have changed. However, except by way of waiver and approval during the Site Plan Review process, the turbine locations will maintain a minimum setback of at least 1,500 feet between the tower location and adjacent residential, public, campground, church, or business structures, and at least 1,500 feet from school property lines.

Should final design of the generation Project facilities alter setback distances, the Project Sponsor will seek the appropriate waivers and/or variances as required by the zoning law.

2.2.10.3 Proposed Mitigation

Measures proposed to mitigate for potential public safety impacts, including compliance with Occupational Safety and Health Administration (OSHA) regulations and state worker safety regulations, are as described in Section 3.10.3 of the DEIS. The Project Sponsor will require all contractors and other personnel on-site during construction and operation of the Project to undergo comprehensive health, safety, and emergency response training. Contractors will also be required to use all appropriate safety equipment necessary to complete construction in a safe manner. A transportation safety coordination effort will also be implemented prior to Project construction. This will include coordination with the applicable Town and School District representatives to prevent or minimize conflicts with school bus schedules, and will also include transportation safety guidelines for Project personnel such as appropriate speed limits for construction vehicles on area roads, etc.

In addition, as indicated in Section 3.10.3 of the DEIS. A Fire Protection and Emergency Response Plan will be implemented. At a minimum, this Plan will include the following:

- Initial and refresher training of all operating personnel (including procedures review) in conjunction with local fire and safety officials.
- Regular inspection of transformer oil condition at each step-up transformer installed at the main substation.
- Regular inspection of all substation components.
- Regular inspection of fire extinguishers at all facility locations where they are installed.
- All Project vehicles will be equipped with firefighting equipment (fire extinguishers and shovels) as well as communications equipment for contacting the appropriate emergency response teams.
- The MSDS for all hazardous materials on the Project site will be on file in the construction trailers (during construction) and the O&M building (during operation), and provided to local fire departments and emergency service providers.
- All wind turbine nacelles will be fitted with suitable fire suppressant equipment.
- The facility Safety Coordinator shall notify the local fire department of any situation or incident where there is any question about fire safety, and will invite an officer of the fire department to visit the workplace and answer any questions to help implement a safe operating plan. The Project Sponsor will provide and maintain appropriate equipment and provide the required level of training to the local fire department.

2.2.11 Community Facilities and Services

2.2.11.1 Existing Conditions

The existing conditions of community facilities and services (i.e., public utilities, police and fire protection services, emergency medical services, education facilities, and recreational facilities.) have not significantly changed since the release of the DEIS. The only changes to existing conditions, as described in the DEIS, pertain to the removal of Project-related facilities in the Town of Watertown. Specifically, the POI substation is now proposed to be located adjacent to the National Grid Black River – Lighthouse Hill 115kV transmission line in the Town of Rutland, instead of adjacent to the National Grid East Watertown substation. Consequently, existing community facilities and services in the Town of Watertown are no longer within the Project area.

2.2.11.2 Potential Impacts

Potential impacts to existing community facilities and services will not significantly change from those described in the DEIS. The micro-siting of proposed turbine locations will not affect these services/facilities and reduction in total turbine number will only serve to reduce potential impacts. Reducing the length of the transmission line and relocation of the POI substation eliminate the need to cross underneath the high pressure natural gas line at the area located between Gotham Road and County Road 160.

Therefore consistent with conclusions presented the DEIS, the Project will not result in significant increase in the demand for utilities such as telephone, natural gas, electric, water, sanitary sewer, etc. Potential demands on police, fire, and emergency medical service providers will be the same or less than those described in the DEIS. Construction workers and operating presence will not generate a significant long term demand on local recreational facilities, school district services/facilities, or other community services/facilities.

2.2.11.3 Proposed Mitigation

Consistent with the findings of the DEIS, the impacts to the local economy, population, and community services resulting from the proposed Project are not of the type or magnitude that will require mitigation. In fact, development of the proposed Project will have minimal impact on population, and place little demand on community services, while at the same time providing significant income and tax revenue to the town, county, and school districts. A Road Use Agreement and associated reparation fund will ensure that any construction damage to local roadways is repaired, so that conditions are equal to or better than those documented in a pre-construction survey (see Section 3.8.3 of the DEIS). The income anticipated from the proposed Project will more than offset any other incurred costs, and can assist with the financing of community services that benefit all residents of the towns and county.

2.2.12 Communication Facilities

2.2.12.1 Existing Conditions

Existing conditions to communications facilities have not significantly changed since the release of the DEIS. Therefore, the studies conducted by Comsearch in 2012 and 2013 (Licensed Microwaves, Off-Air Television Reception Analysis, AM/FM Radio Broadcast Analysis, Mobile Phone Services Analysis, and Land Mobile Radio and Emergency Services Search) for the proposed Project area remain valid. Proposed changes to the Project that are relevant to communications involve minor turbine relocation and the reduction of the total number of turbines. Consequently, additional communication studies are not warranted as the Project has been reduced in scale and the proposed changes remain within the original area of study conducted by Comsearch.

2.2.12.2 Potential Impacts

Consistent with the DEIS, the proposed micro-siting of turbines utilized the results of studies conducted by Comsearch to ensure that communication interference would be avoided or minimized. None of the proposed turbine locations interferes with a microwave beam path, and reduction in the number of turbine locations reduces possible sources of interference with surrounding communication systems. Therefore, potential impacts are consistent with, or less than, reported in the DEIS.

2.2.12.3 Proposed Mitigation

Proposed mitigation will not change from the plans outlined in the DEIS. The Project owner has strategically sited proposed turbines in an effort to eliminate possible interference with surrounding communication systems. However, should project construction or operation result in impacts to communication systems, the Project Sponsor will address and resolve each individual problem as necessary. A draft Complaint Resolution Plan is included in Appendix G of this FEIS. In addition, as indicated in the DEIS consultation with Fort Drum representatives is ongoing. Fort Drum representatives have indicated that there may be an upgrade or new technology available which would mitigate the amount of interference caused by the Project as it relates to the radar system used by the base. Fort Drum is currently investigating the possibility of implementing the new software/radar technology at the base, and is corresponding with the Project Sponsor regularly to keep them apprised of the status of this potential mitigation.

2.2.13 Land Use and Zoning

As stated in Section 3.13 of the DEIS, land use and zoning in the Project area was determined through review of local town codes, tax parcel maps, aerial photographs, and field review conducted during 2012. In the DEIS, land

use and zoning are discussed in terms of regional land use patterns, Project area land use and zoning, agricultural land use, and future land use. This section describes any updates to zoning or land use that have occurred since release of the DEIS, as well as any changes to zoning and land use impacts as a result of the project changes.

2.2.13.1 Existing Conditions

2.2.13.1.1 Regional Land Use Patterns

Regional land use patterns are as described in Section 3.13.1.1 of the DEIS.

2.2.13.1.2 Project Area Land Use and Zoning

Project area zoning is largely as described in Section 3.13.1.2 of the DEIS. The turbines and other project components, including the transmission line, are proposed to be located in the same zoning districts described in the DEIS, except that the transmission line and interconnect substation no longer extend into the Town of Watertown. However, since the publication of the DEIS, setback requirements for turbines as required by the Town of Denmark Zoning Law have been amended. The changes to the regulations do not alter the setback distance previously required; however, they now include a provision for the Project Sponsor to enter into waiver agreements with affected, non-participating landowners, should they be required. Instead, the amendments expand and clarify the wording of the requirements. The amended setback requirements are as follows (emphasis added only to changes):

- From adjacent road centerlines, facilities must be set back to the highest portion of the nacelle, plus twice the length of one rotating blade. (Note: the substance of this portion of the setback regulations is unchanged from the original.)
- From any residence, public building, campground, church or business, facilities must be set back 1,500 feet from such *structures*. In addition, from any school *property line*, facilities must be set back 1,500 feet. Owner occupants of residential structures may consent in writing to vary this distance, subject to the provision of adequate property access in the event of facility collapse. In this case, the facility may not be closer than the highest portion of the nacelle plus twice the length of one rotating blade from the residence. *This agreement must be recorded in the Lewis County Clerk's Office and in the property deed. The agreement must provide, among other things, in the event of a collapse, the developer and owner of the Wind Power Generating Facility shall have access to the property for the purpose of removal of debris and restoration.*
- From the side and rear lot lines of bordering parcels, facilities must be set back to the highest portion of the nacelle, plus twice the length of one rotating blade. Adjacent property owners may waive this requirement,

subject to the provision of adequate property access in the event of facility collapse. *This agreement must be recorded in the Lewis County Clerk's Office and in the property deed. The agreement must provide, among other things, in the event of a collapse, the developer and owner of the Wind Power Generating Facility shall have access to the property for the purpose of removal of debris and restoration. Nothing in this Law should be construed so as to limit the number of Wind Power Generating Facilities to be placed upon a parcel by a developer provided the setbacks in this paragraph comply with the setbacks for structures and school property lines.* (Town of Denmark, 2013).

Following submittal of the DEIS, OwnEnergy revisited the Town of Champion Zoning Ordinance to determine if classification of the proposed transmission line as an "essential facility", as indicated in the DEIS, was appropriate. Upon further examination of the ordinance, it appears that this facility would more approximately be classified as a "public utility". Article 2 of the Town of Champion Zoning Law defines "public utilities" as:

> *A privately or publicly owned structure or facility that serves the general public or some of the public. Such facilities shall include, but not be limited to, sewage treatment plants, landfills, water supply facilities, power generating and distribution facility, radio transmitting centers, etc*.

Based on this definition, for a structure or facility to qualify as "public utilities" it must (1) be privately or publically owned and (2) serve some or all of the general public. The proposed transmission line project meets this definition because (1) OwnEnergy is a privately owned company and (2) the transmission line will interconnect to the State electric grid whereby the electricity generated by the Project will serve the general public. Moreover, the definition contemplates "[s]uch facilities" to include a power generating and/or distribution facility. Therefore, the proposed electric transmission line structures or facilities are public utilities.

As shown in Figure 3B, the electric transmission line within the Town of Champion is proposed to be primarily located along Plank Road between Bach Road 2 and Humphrey Road (as well as cross-country on private land). According to the Town's Zoning Map, the transmission line is located entirely within the Agricultural Resource District ("AR"). Article 4 of the Town of Champion Zoning Law sets forth the "Use Control Schedule" for the Town. Under Article 4, "Public utility" structures are permitted in an AR zone and require site plan approval by the Planning Board.

In contrast to the term "public utilities", the Zoning Law defines the term "essential facilities in Article 2 as:

> *The operation or maintenance by municipal agencies or public utilities of electrical or gas substations; electrical or gas transmission lines; water treatment, storage and transmission facilities; pumping stations; and similar facilities. The definition of essential services shall not include minor or major wind power generating facilities* (emphasis added).

The use of the generic term "public utilities" in the definition of the term "essential facilities" is assumed to refer to traditional transmission owners, such as National Grid, Niagara Mohawk, NYSEG, and similar "public utilities". As mentioned above, the Project Sponsor is neither a municipal agency nor public utility and therefore, the definition for essential facilities does not appear to apply to the proposed transmission line. Rather, the line is a structure of facility that serves the general public by supplying electricity and therefore is most appropriately characterized as a "public utility" as the term is defined in the Town of Champion Zoning Law.

Based on the above, the Project Sponsor will need to apply for site plan approval from the Town of Champion Planning Board, rather than seeking a special permit (required for essential facilities), as described in the DEIS. The Project Sponsor has initiated discussion with the Planning Board regarding this matter and anticipates submitting a site plan application following completion of the SEQRA review process. Please note that since the Town of Denmark Planning Board conducted a coordinated review under SEQRA, the Town of Champion Planning Board will not need to make a separate SEQRA determination for the Project.

Land use in the Project area is generally as described in Section 3.13.1.2 of the DEIS. However, due to changes in the number and location of Project components, the acreages of each type of land use within the Project area have changed somewhat. According to the New York State Office of Real Property Services (NYSORPS), the Project area consists of four distinct land use categories (Figure 8). The majority of the Project area (approximately 7,535 acres [81.9%]) is categorized as Agricultural, which is described by the NYSORPS as "property used for the production of crops or livestock". Approximately 1,002 acres (10.9%) of the Project area is characterized as Residential, which is described as "property used for human habitation". Vacant Land, described as "property that is not in use, is in temporary use, or lacks permanent improvement" constitutes 515 acres (5.6%) of the Project area. Finally, the remaining 148 acres (1.6%) of the Project area are under conservation easement.

As described in Section 3.13.1.2 of the DEIS, Lewis and Jefferson Counties have designated Agricultural Districts established pursuant to the New York State Agriculture and Markets (NYSA&M) Law. The entire generation site is located within Lewis County Agricultural District 6, and portions of the transmission line are within Jefferson County Agricultural District 1 (Figure 7). Overall, 93% of the Project area is designated Agricultural District land.

2.2.13.2 Potential Impacts

Potential impacts on land use, including temporary, construction-related impacts, as well as permanent impacts (associated with Project operation) are described below.

2.2.13.2.1 Construction

According to NYSORPS land use designations, construction-related disturbance to Agricultural land will total approximately 456.5 acres, of which 419.6 acres will be temporary disturbance. This represents a decrease of approximately 15 acres of temporary disturbance and 10 acres of permanent impact from the previous Project configuration as described in the DEIS. Along with this direct impact to agricultural land, movement of equipment and material could result in damage to growing crops, fences and gates, and subsurface drainage systems (tile lines). Project construction could also temporarily block farmers' access to agricultural fields, and alter the timing and location of certain agricultural activities (e.g., pasturing livestock, harvesting crops). However, wind turbines and associated facilities have been sited so as to minimize loss of active agricultural land and interference with agricultural operations.

In addition, construction will result in the disturbance of approximately 60.4 acres of land classified as Residential by the NYSORPS (a decrease of 5 acres since the DEIS). Impacts to Residential land are confined to the properties of participating landowners. There will also be 32.8 acres of disturbance to land classified as Vacant (10 acres less than the layout described in the DEIS), along with 0.8 acre of disturbance to conservation easement area. The DEIS described a Project layout with potential impact of 1 acre and 2 acres to land classified by the NYSORPS as Recreation & Entertainment and Public Services, respectively. Subsequent Project changes have entirely eliminated impacts to these land uses.

Table 15 summarizes impacts to Agricultural Districts, as designated by the NYSA&M. Most of these impacts will be temporary and subject restoration during/after construction. Mitigation measures that will be implemented to minimize impacts to agricultural land are described below in Section 2.2.13.3 (see also Section 3.13.3 of the DEIS).

Table 15. Impacts to Agricultural District Land

	Total Disturbance (Acres)	Converted to Built Facilities (Acres)	Temporary Disturbance (Acres)
Soils			
Lewis County District 6	330.4	44.5	285.9
Jefferson County District 1	17.1	0.5	16.6
Total Disturbance to Soils	347.5	45.0	302.5
Vegetation			
Lewis County District 6	425.5	44.5	381.0
Jefferson County District 1	96.5	0.5	96.0
Total Disturbance to Vegetation	522.0	45.0	477.0

2.2.13.2.2 Operation

As described in Section 3.13.2.2 of the DEIS, the proposed Project is consistent with existing zoning/wind energy facilities regulations and land use patterns within the Towns of Denmark, Champion, and Rutland. Project facilities will comply with setback requirements as outlined in the local zoning laws, or obtain the appropriate variances or waivers. The turbines will maintain minimum setback of 642 feet from the centerline of non-seasonal public roads, and from the property lines of all adjacent parcels owned by non-participating neighbors except by way of waiver. In addition, except by way of waiver, the turbine locations will maintain a minimum setback of at least 1,500 feet between the tower location and adjacent residential, public, campground, church, or business structures, and at least 1,500 feet from school property lines. Should final design of the generation Project facilities alter setback distances, the Project Sponsor will seek the appropriate waivers and/or variances as required by the zoning law. Only very minor changes in land use within the Project area are anticipated as a result of Project implementation. The 47 turbine sites, substations, and other ancillary facilities represent the cumulative permanent conversion of approximately 45 acres of land from its current use (compared to 58 acres with the layout described in the DEIS). Of these 45 acres, approximately 37 acres are categorized as Agricultural by the NYSORPS, 5 acres are categorized as Residential, and 3 acres are categorized as Vacant.

2.2.13.3 Proposed Mitigation

Proposed mitigation includes full compliance with local ordinances and with the revised NYSA&M agricultural protection guidelines for wind power projects (see Appendix K). As indicated in the DEIS, the Project will comply with the requirements of all local zoning, or will obtain any required waivers or variances, as specified in the local ordinances. Because the transmission line in the Town of Champion would likely be classified as a “public utility”, as defined by the Town Zoning Ordinance, the Project Sponsor will seek site plan approval from the Champion Planning

Board, rather than a Special Permit, as indicated in the DEIS. Agricultural protection measures include but are not limited to; filing of a Notice of Intent (if necessary) to Undertake Action in an Agricultural District, designing/siting roads to minimize impacts to farm operations, avoiding impacts to surface and subsurface drainage features to the extent practicable, stripping and stockpiling topsoil separate from subsoil, installing buried interconnect at a minimum depth of 48 inches in agricultural fields, and stabilizing disturbed agricultural areas with seed and/or mulch. See Section 3.13.3 of the DEIS for further information.

2.2.14 Unavoidable Adverse Impacts

Please see Section 4.0 of the DEIS for a discussion of unavoidable adverse impacts; general minimization and avoidance measures; specific mitigation measures; and the environmental compliance and monitoring program.

2.2.15 Alternatives Analysis

Alternatives to the proposed Project that were considered are the same as those described in the DEIS. However, with the revised layout currently proposed, several alternatives have been incorporated into the Project design. These alternatives, and the reasons for their selection, are discussed in the following section.

2.2.15.1 Alternative Project Area/Project Sites

The feasibility of an alternative Project Area/site was thoroughly discussed in Section 5.1 of the DEIS. However, as noted throughout this FEIS, the revised Copenhagen Wind Farm includes fewer turbines located within a somewhat smaller Project Area (i.e., area of leased land) than the Project evaluated in the DEIS. As discussed previously, reduction in the size of the Project and the Project Area has generally resulted in a modest reduction of potential environmental impacts.

2.2.15.2 Alternate Project Design/Layout

Wind Turbine Selection

As indicated in the DEIS, several factors drive the selection of wind turbines for a project, including market competition, market availability (supply), industry trends, and site/wind resource conditions. The type of wind turbine evaluated in the DEIS was the GE 1.62 MW turbine, with a 96-meter hub height and a 100-meter rotor diameter. Based on technological improvements to the 1.62 MW turbine, the rated capacity has increased to 1.7 MW, so the turbine now being proposed is the GE 1.7 MW turbine. Proposed tower height and rotor diameter have not changed. Like the original 1.62 MW machine, the proposed 1.7 MW turbine is a Class III turbine, which matches the wind regimes at the Project Site. The change in turbine model has the potential to generate more electricity, but will not

substantially change any of the anticipated environmental impacts. The smaller number of turbines proposed as a result of selecting the new turbine will actually reduce most impacts, as discussed throughout this FEIS.

Use of substantially larger turbines might further reduce impacts, but as was the case at the time the DEIS was released, the Applicant's production estimates and indicative unit pricing for larger turbines do not compare favorably with the currently proposed alternative.

Alternate Turbine Layouts

As stated in Section 5.2.2 of the DEIS, the process of determining Project design and layout involves continuous evaluation of alternatives. This process has been ongoing since release of the DEIS, and has resulted in the selection of 47 proposed turbine sites from the 62 potential sites identified in the DEIS. Final turbine site selection (and layout of other Project components) was driven primarily by the goals of reducing wetland and agricultural impacts, optimizing the wind resource, avoiding construction constraints, and addressing the concerns/desires of participating landowners and neighbors. Details regarding how such siting decisions are made were provided in the DEIS.

Electrical Collection Lines

Final length of the electrical collection system has been reduced from approximately 24 miles to approximately 20 miles. Along with reduced overall length, final layout of the collection system served to reduce impacts to forest land, streams, and wetlands, relative to the layout evaluated in the DEIS.

Electrical Transmission Line

The route of the electrical transmission line is similar to that evaluated in the DEIS, but has been modified since release of the DEIS. The location of the line has been altered in places to accommodate landowner requests and minimize agricultural and wetland impacts. It has also been shortened from approximately 10 miles to 9 miles due to relocation of the collection and interconnection substations (see discussion below).

Substations

The collection substation has been relocated approximately 2,090 feet northwest of the location shown in the DEIS. The purpose of this relocation was at the request of the landowner hosting the substation and to address the concerns of adjacent residents regarding visual and noise impacts, as well as to reduce substation visibility from Route 12. The collection substation is now approximately 1,430 feet from Route 12 and over 1,310 feet from the nearest adjacent residence. It is also partially screened from view by nearby hedgerows and woodlots.

Consequently, potential visual and noise impacts associated with the collection substation have been substantially reduced, relative to those that could have occurred with the location proposed in the DEIS.

Based on further consultation with National Grid, the proposed transmission line will also no longer connect with the existing East Watertown Substation. A new point of interconnection substation is now proposed to be built approximately 1.2 miles east of the East Watertown substation. The new substation will be approximately 215 by 200 feet in size, and will connect with National Grid's existing Black River –East Watertown 115 kV line. The substation will be located directly adjacent to the existing line, and will be approximately 840 feet from the nearest private residence. Its distance from adjacent viewers will minimize visual, noise, and land use impacts.

Access Roads

Like the electrical collection system, the location of proposed access roads has been revised to minimize agricultural, stream, wetland, and forest impacts, and/or to accommodate landowner requests. The overall length of the access road system has been reduced from 17 miles to approximately 15 miles.

2.2.15.3 Alternative Project Size

As indicated in the DEIS, the Copenhagen Wind Farm has a 79.9 MW interconnection request with the NYISO. Therefore, the preferred project size is a facility that has the ability to produce 79.9 MW of power. The Project as currently proposed includes 47 1.7 MW turbines, as opposed to 49 1.62 MW turbines. Thus, the overall nameplate capacity of the Project remains essentially the same as originally proposed (79.9 vs. 79.4 MW). The feasibility of a substantially smaller or larger project is as described in the DEIS.

2.2.15.4 Other Alternatives

The pros and cons, and feasibility of alternative technologies, alternative construction scheduling, and the no action alternative are as described in Sections 5.4, 5.5 and 5.6 of the DEIS. In regard to alternatives that avoid significant impacts (as discussed in Section 5.7 of the DEIS), the 79.9 MW Project layout, as currently proposed, minimizes adverse environmental impacts associated with Project construction and operation to the extent practicable.

2.2.16 Irreversible and Irretrievable Commitment of Resources

The reduced size of the Project will result in an incremental reduction in the commitment of land area; manufacturing and construction materials; and energy resources required for Project construction and operation as compared to the DEIS Project layout. However, the general discussion of irreversible and irretrievable commitment of resources presented in Section 6.0 of the DEIS remains accurate for the revised Project.

2.2.17 Growth Inducing Impacts

As described in Section 7.0 of the DEIS, the proposed Project is not anticipated to lead to significant growth in local population, housing, or businesses, nor is the Project anticipated to attract further wind power development in the area. The Project utilizes the land resource of willing property owners within the Towns of Denmark, Rutland, and Champion, while maintaining environmental sensitivity. Any additional wind power development in these towns is likely to be limited due to set-back constraints and more significant environmental impacts. The Maple Ridge Wind Farm presents a helpful example: it is located in a similar community within Lewis County and has been operational for over eight years, but has not resulted in significant new demand for housing or services. The Maple Ridge project has also not expanded or otherwise promoted additional wind power development in the area.

The Project Sponsor continues to engage in a productive dialogue with affected and participating taxing jurisdictions on the PILOT terms. It is expected that the parties will reach agreement and that the PILOT will be executed in the first half of 2014. The PILOT will provide revenue to local taxing jurisdictions that can be used to lower taxes or to improve community facilities and services for area residents. This could provide some incentive for businesses and residences to locate there, but any associated growth inducing impact is expected to be minimal.

2.2.18 Cumulative Impacts

As of January 7, 2014, no additional projects in close proximity to the Copenhagen Wind Farm have been added to the NYISO interconnection queue since the release of the DEIS. Therefore, the projects considered in the DEIS cumulative impacts discussion (the proposed/permitted Roaring Brook Wind Power Project and the existing/operational Maple Ridge Wind Farm; DEIS Section 8.0) are still appropriate for this analysis. Relative to what was described in the DEIS, only very minor changes to cumulative impacts are anticipated with the revised Project layout being addressed in this FEIS. These changes are due to the reduced number of turbines proposed, and generally result in a reduction of cumulative impacts. While the general discussion presented in DEIS Section 8.0 remains accurate, the specific cumulative avian/bat impacts and cumulative visual impacts that were quantified have changed slightly with the revised layout. These changes are described below.

<u>Cumulative Avian/Bat Impacts</u>

Cumulative mortality impacts may arise from interactions between the impacts of the proposed Project and the impacts of other wind energy facilities in the area. Such projects include the operational Maple Ridge Wind Project, a 195-turbine facility located 2.4 miles to the south, and the planned Roaring Brook Wind Farm, a permitted 39-turbine facility located 9.5 miles to the south. As indicated in Section 3.3.2.2.2 of the DEIS, there currently is no predictive

model available that has been demonstrated to accurately predict avian collision mortality as a result of wind power project operation. Therefore, risk assessments must be based on empirical data from operating projects. The cumulative mortality impact estimates for birds and bats have been updated as follows:

- Avian – Using the range of mortality rates observed across New York State (0.66 to 9.59 birds/turbine/study period), cumulative avian mortality for the Copenhagen, Maple Ridge, and Roaring Brook wind energy facilities is estimated to be between approximately 186 and 2,695 birds per year.

- Bats – Using the range of mortality rates observed across New York State (0.7 to 40 bats/turbine/study period), cumulative bat mortality for the Copenhagen, Maple Ridge, and Roaring Brook wind energy facilities is estimated to be between approximately 197 and 11,240 bats per year.

Due to the reduced number of turbines proposed, the updated cumulative avian and bat mortality estimates represent a reduction of approximately 5.1% compared to the predicted cumulative impacts presented in the DEIS.

Cumulative Visual Impacts

An updated cumulative viewshed analysis was prepared for the revised Project layout consistent with the methods described in Section 8.0 of the DEIS. The results of the revised cumulative viewshed analysis are depicted in Figure 10 Sheets 5 and 6, and are compared with the results of the DEIS cumulative viewshed analysis below in Table 16. Cumulative visual impacts of the proposed Project with the existing Maple Ridge Wind Farm were evaluated within the approximately 340 square mile area that lies within 10 miles of both Copenhagen and the Maple Ridge wind turbines "Maple Ridge Cumulative Study Area". Additionally, cumulative visual impacts of the proposed Project with both the existing Maple Ridge Wind Farm and the previously permitted Roaring Brook Wind Farm were evaluated within the approximately 163 square mile area that lies within 10 miles of all three of these projects "Maple Ridge and Roaring Brook Cumulative Study Area.

As indicated in Table 16, approximately 67 percent of the Maple Ridge Cumulative Study Area would have views of both projects according to the topographic viewshed, or approximately 21 percent when the screening effects of forest vegetation are taken into account. This indicates that the primary cumulative impact of the proposed Project with the existing Maple Ridge Wind Farm is that a greater number of turbines would be visible from areas that already have wind turbine views. To a lesser extent, some areas within this study area that do not currently have views of the Maple Ridge turbines would have views of the proposed turbines. The topographic viewshed analysis indicates that this may occur in approximately 15 percent of the Maple Ridge Cumulative Study Area, or 9 percent when factoring screening by forest vegetation into the analysis.

With respect to cumulative visual impacts that would result if all three wind farms became operational, Table 16 indicates that approximately 52 percent of the Maple Ridge and Roaring Brook Cumulative Study Area may have views of turbines from all three projects according to the topographic viewshed analysis. Factoring the screening effects of forest vegetation into the analysis decreases this area significantly to approximately 6 percent. The analysis further indicates that there would be very few areas where the Maple Ridge Wind Farm is not currently visible that would have views of both the Roaring Brook and Copenhagen Wind Farms (less than 1 percent), but that turbines from both the Copenhagen and Maple Ridge Wind Farms may be available from approximately 24 percent (considering topography only) or 14 percent (considering both topography and forest vegetation) of this study area. The analysis also indicates that approximately 4 to 5 percent of this study area would have views of the Copenhagen Wind Farm in locations where neither the Maple Ridge or Roaring Brook Wind Farms are visible.

As shown in Table 16 below, the changes in turbine layout that have occurred since the release of the DEIS have a minimal effect on the results of the cumulative viewshed analysis (generally a decrease of less than 1 percent). This is largely because the cumulative viewshed analysis only accounts for whether or not any turbines associated with a particular project are visible and does not evaluate the number of turbines visible from each project, which is primarily where the difference between the DEIS and FEIS viewshed results for the Copenhagen Wind Farm are apparent (see Section 2.2.5 of this FEIS). Given the viewshed results presented in Section 2.2.5 of this FEIS and the decrease from 62 to 47 turbines proposed, it is reasonable to conclude that cumulative visual impacts with respect to the number of Copenhagen Wind Farm turbines visible have decreased from the DEIS layout to the FEIS layout.

Table 16. DEIS/FEIS Cumulative Viewshed Visibility Comparison

Cumulative Viewshed Results: Copenhagen and Maple Ridge Wind Farms[1]								
Project Visibility	Topography Only				Topography and Vegetation			
	DEIS		FEIS		DEIS		FEIS	
	Square Miles	% of Study Area	Square Miles	% of Study Area	Square Miles	% of Study Area	Square Miles	% of Study Area
Turbines from Both Projects Potentially Visible	228.7	67.3	226.0	66.6	71.6	21.1	70.6	20.8
Only Copenhagen Wind Farm Turbines Potentially Visible	54.3	16.0	50.5	14.9	31.2	9.2	29.8	8.8
No Copenhagen Wind Farm Turbines Visible	56.8	16.7	62.8	18.5	237.0	69.8	238.8	70.3
Cumulative Viewshed Results: Copenhagen, Maple Ridge and Roaring Brook Wind Farms[2]								
Project Visibility	Topography Only				Topography and Vegetation			
	DEIS		FEIS		DEIS		FEIS	
	Square Miles	% of Study Area	Square Miles	% of Study Area	Square Miles	% of Study Area	Square Miles	% of Study Area
Turbines from All Three Projects Potentially Visible	86.9	53.2	85.2	52.1	10.3	6.3	10.1	6.2
Only Copenhagen and Maple Ridge Wind Farm Turbines Potentially Visible	39.3	24.0	38.9	23.8	23.1	14.1	22.6	13.8
Only Copenhagen and Roaring Brook Wind Farm Turbines Potentially Visible	1.2	0.8	1.0	0.6	0.2	0.2	0.2	0.1
Only Copenhagen Wind Farm Turbines Potentially Visible	8.0	4.9	7.5	4.6	6.4	3.9	6.2	3.8
No Copenhagen Wind Farm Turbines Visible	28.1	17.2	30.8	18.9	123.5	75.5	124.2	76.0

[1] The Maple Ridge Cumulative Study Area (the area within 10 miles of one or more turbines from both the Copenhagen and Maple Ridge Wind Farms) totals approximately 340 square miles.

[2] The Maple Ridge and Roaring Brook Cumulative Study Area (the area within 10 miles of one or more turbines from all three projects [Copenhagen, Maple Ridge and Roaring Brook Wind Farms]) totals approximately 163 square miles.

As described in Section 2.2.5.2.1, seven of the fifteen visual simulations included in the DEIS were revised to reflect the revised Project layout (see Appendix A). The revised simulations are presented in as three-sheet figures, each showing 1) a view of the existing conditions, 2) a view of the previously proposed DEIS layout, and 3) a view of the proposed FEIS Layout. One of these simulations, Viewpoint 96, illustrates cumulative visual impacts. The existing conditions at Viewpoint 96 consist of the view along Porter Road in the Town of Harrisburg, a rural, un-striped road

that extends away from the viewer. Agricultural equipment and rolled hay bales in the immediate foreground on the left side of the road evoke a strongly rural character. Portions of 17 existing wind turbines from the Maple Ridge Wind Farm extend from the foreground into the mid-ground and are the dominant features in the view. With the proposed Project in place, numerous turbines can be seen rising in the background above the forest ridge that forms part of the horizon. The number of turbines in the background along the horizon is reduced in the FEIS layout compared to the DEIS layout, and the turbines are spaced further apart. As stated in the VIA (DEIS Appendix J), the visual impact of the proposed Copenhagen turbines was already diminished from this vantage point, due to the fact that the existing Maple Ridge wind turbines are located closer to the viewer and dominate the view. When compared to the DEIS layout, the reduced number of proposed turbines visible along the horizon in the view of the FEIS layout further minimizes the visual impact of the Copenhagen Wind Farm in this view.

2.2.19 Effects on Use and Conservation of Energy Resources

As stated in Section 9.0 of the DEIS, the Project is proposed at a time of significant energy uncertainty, at both the state and national levels. At 79.9 MW of generation capacity, the Project will generate enough energy annually to serve between approximately 21,000 and 33,000 homes. The Project will add to and diversify the state's sources of power generation, accommodate future growth in power demand through the use of a renewable resource (wind), and over the long term, will displace some of the state's older, less efficient, and dirtier sources of power. Wind energy generation results in reductions in air emissions because of the way the electric power system works. In a report released by Environment America in Fall 2013, the authors estimated that the wind energy produced in New York State in 2012 resulted in avoiding emissions of 1,834,576 metric tons of carbon dioxide (CO2), 1,724 tons of nitrogen dioxide (NO2), and 2,130 tons of sulfur dioxide (SO2) (Environment America, 2013).

In addition, in the time since the DEIS was released, the NYSDEC has revised the Full Environmental Assessment Form (EAF), effective October 2013, which requires a more detailed analysis of a proposed action's potential impact on air quality. Specifically, the revised EAF requires a relative quantification of greenhouse gas emissions such as carbon dioxide and nitrous oxide. Clearly the NYSDEC, whose mission is "to conserve, improve and protect New York's natural resources and environment, and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being", is concerned about the negative effects of climate change and greenhouse gas emissions. The proposed Project would assist the State in mitigating these negative effects and meeting their short and long-term energy goals.

3.0 CORRECTIONS TO THE DEIS

During the preparation of the FEIS, a small number of errors were identified within the DEIS. Corrections to these errors are described below.

- The Summary of Potential Impacts Table in Section 1.0 erroneously included a reference to the Cortland County landfill. The Copenhagen Wind Farm is not located in proximity to any landfills.
- Section 2.5.3 of the DEIS indicated that the POI substation would house the command center of the Project's supervisory control and data acquisition (SCADA) system. This is incorrect. The SCADA system will be operated from the O&M Facility.
- As described in the third column of Table 2 in Section 2.9, the involvement of the U.S. Fish and Wildlife Service should read as follows: "Coordination and/or consultation pursuant to the Endangered Species Act."
- Section 3.1.1.3 of the DEIS included the following statement, "Areas of moderate erosion hazard occur in small patches throughout the Project area, primarily associated with slopes in excess of 15 percent. This is limited to several small areas along the transmission line corridor, the location of Turbine 15 and associated buried interconnect, the access road approaching Turbines 36 through 38, and a small section of buried interconnect between Turbines 43 and 46." There was no Turbine 43 included in the DEIS layout. The quoted excerpt should have ended with reference to the section of buried interconnect between Turbines 42 and 46.
- Section 3.3.1.2.6 of the DEIS contained in error in the discussion of a 2005 NYSDEC radio telemetry study. The number 71 should have referred to the number of roost trees in the study, not the number of bats. Only 32 bats were fitted with transmitters in the 2005 NYSDEC study; of those, 26 bats were tracked to at least one roost tree. A total of 71 roost trees were used by the Indiana bats during the study. However, the conclusion that Indiana bats from the Glen Park hibernaculum are unlikely to use trees within the Project area for maternal roost colonies remains true: 100% of the roost trees were in Jefferson County. No tracked bats flew southeast toward the Project area, and none flew to maternal roost sites in Lewis County.
- Table 10 in Section 3.3.2.2.2 of the DEIS contained an error in the bat fatalities per MW per study period column for the 2009 post-construction studies conducted at Cohocton and Dutch Hill. For the daily surveys at these projects, the correct mortality rate is 26.7 bats/MW/period, while the correct mortality rate for the weekly surveys is 9.2 bats/MW/period (Stantec, 2011a). An associated error was found in the corresponding text, where the first sentence of the second paragraph of the bat fatality approximation discussion incorrectly stated the range of bat mortality rates observed in recent studies across New York State. The corrected values have been used to update the bat mortality approximations in FEIS Section 2.2.3.2.

- Section 3.3.2.2.3 of the DEIS erroneously stated the distance from the nearest hibernaculum used by Indiana bats. The nearest proposed turbine is located approximately 22 kilometers (13.7 miles) southeast of the Glen Park hibernaculum.
- Section 3.5 in the DEIS (see DEIS Tables 14 and 15) and the VIA (DEIS Appendix J; edr, 2013a: 33, 52, 57, 58) describe the potential visual effect of the Project from Viewpoint 95, located on Porter Road in the Town of Harrisburg. This includes a visual simulation (included in VIA Appendix A) identified as representing the view from Viewpoint 95 as well as identification of Viewpoint 95 as a simulated viewpoint on VIA Figure 9: Viewpoint Location Map. However, the identification of this view as Viewpoint 95 was erroneous. The simulation included and discussed in the VIA is actually the view from Viewpoint 96, located approximately 0.8-mile further from the Project (than Viewpoint 95) and also located on Porter Road in the Town of Harrisburg. In all other respects, the consideration of visual effects from this location (i.e., Viewpoint 96 not 95) in the VIA and DEIS were correct.

4.0 RESPONSE TO PUBLIC COMMENTS

The DEIS for the Copenhagen Wind Farm was accepted as complete by the Lead Agency on June 4, 2013 and copies of the DEIS were subsequently delivered to involved/interested agencies and individuals, and posted to a website managed by Copenhagen Wind Farm, LLC (http://www.ownenergy.net/project-development/copenhagen-wind-farm). Opportunities for detailed agency and public review were provided during the DEIS public comment period (June 4, 2013 through July 23, 2013), including a public hearing conducted by the Lead Agency on July 9, 2013 at the Copenhagen Central School High School Gymnasium. Written and oral comments received during the DEIS public comment period are summarized and addressed in this FEIS. Eleven separate "comment letters" (hardcopy, email, and oral comments) were received that provided 158 individual comments being considered during the FEIS analysis. Each of the specific comments received on the DEIS is addressed below.

Comment Letter 1. Guy Manor

Comment 1A: Commenter supplied a printed copy of a webpage for NOAA's National Weather Service, Radar Operations Center, on the NEXRAD WSR-88D Radar. The webpage describes its goals to increase awareness and understanding of potential wind turbine interaction with Doppler Weather Radars and requests developers of turbines to access the site's database early in development to minimize operational conflicts with the NEXRAD network and weather warning programs.

Response 1A: As described in Section 3.12.1.6 of the DEIS, the Project Sponsor sent a written notification of the proposed Project to the National Telecommunications and Information Administration (NTIA) of the U.S. Department of Commerce. If the proposed turbines were expected to cause operational conflicts with the NEXXRAD network and/or weather warning programs, these concerns would be identified by the NTIA. After completing their review, the NTIA indicated that no agencies had issues with turbine placement in this area, and therefore no impacts to radar operations are anticipated.

Comment Letter 2. Kenneth Clark

Comment 2A: The Commenter expressed concerns about turbines interfering with radio transmission of data from the village water plant facility to the village office in Copenhagen. We have a 50 foot tower and the placement of these windmills is between our water plant and the Village of Copenhagen. The radio transmission of that material from that plant to the Village of

Copenhagen is very important. It is required by state agencies and cannot be interfered with in any way.

Response 2A: Comsearch identified the registered site-based frequencies for land mobile and emergency services radio coverage. The majority of these systems are licensed to governmental bodies including the State of New York, Lewis County, and local municipalities. All of the licensed land mobile (LMR) stations in the Project area are located more than 77.5 meters (254 feet) from the proposed turbines. Thus, the turbines meet the setback distance criteria for Federal Communications Commission (FCC) interference emissions in the land mobile bands, and no impacts are anticipated to LMR and emergency services coverage. See Section 3.12 of the DEIS for additional information.

Comment 2B: The commenter is concerned that the construction and placement of the towers might interfere with the water supply that goes into the mills. Is it going to affect the aquifer? That is a very serious question. Are they going to dynamite? Are they going to drill? The windmills are uphill from where the water plant is, probably less than 120 feet from the plant.

Response 2B: Since the release of the DEIS, Haley & Aldrich performed a Hydrogeological Study evaluating groundwater resources in the Project area (see Appendix C). According to that assessment, construction of the wind turbine foundations and associated infrastructure should not result in a significant adverse impact to the groundwater resources in the vicinity of the Project. Construction activities will be sited away from existing residential water wells and surface water features. The Hydrogeological Study identified all residences located within 2.500 feet of a proposed turbine, and none were identified within 1,000 feet of the nearest turbine site. Furthermore, the majority of the construction will involve only shallow soil and/or bedrock excavation, generally within eight feet or less of existing ground surface. The construction would involve commonly-utilized construction methods such as placement of steel reinforced concrete and shallow trenching. If required, blasting would be done in accordance with an approved blasting plan, using appropriately-sized charge weights and delays, to minimize the amount of ground vibration generated and to limit the bedrock fracturing to the proposed foundation area. Such work would be designed and constructed in a manner which keeps disturbance localized, and utilizes best management practices to assure little or no impact to groundwater resources or nearby wells. Based on the anticipated distances between turbine locations and area residences, the potential for impact to the water level within, or water yield

from, a residential well due to blasting is considered to be very low (Haley & Aldrich, 2014). See also Section 2.2.2 of the FEIS, which includes new information about water resources in the Project area, and updates the impact and mitigation discussions from the DEIS based on the revised Project layout and the results of the Hydrogeological Study.

Comment 2C: The commenter is concerned about impacts to drinking water and the filtration system. The three local wells already reveal surface water contamination. We put a filter system down there that's capable of filtering any materials that go into the water before it comes to the Village of Copenhagen. It's a very sensitive system and when we get heavy rain, it affects the filters. Is the construction of the windmills going to dirty the water or put minerals in the water that will plug the filters?

Response 2C: With regard to potential impacts to the water supply from blasting, see Response to Comment 2B, the Hydrogeological Study included as Appendix C, and Section 2.2.2 of the FEIS. In terms of clogging filters with sediment resulting from construction activity, any sediment introduced to the groundwater due to excavation activities is anticipated to settle out within a short distance of the excavation site. Distance of the proposed turbines from municipal wells will minimize the chances of any groundwater-borne sediment from reaching the wells. To protect both surface water and groundwater quality, a soil erosion and sedimentation control plan will be developed and implemented as part of the SPDES General Permit for the Project. To protect water quality, silt fence, hay bales, and temporary siltation basins will be installed and maintained throughout Project construction. Exposed soil will be seeded and/or mulched to assure that erosion and siltation is kept to a minimum. Specific control measures will be identified in the Project SWPPP, and the location of these features will be indicated on construction drawings and reviewed by the contractor and other appropriate parties prior to construction. These features will be inspected on a regular basis (minimum of once weekly) to assure that they function properly throughout the period of construction, and until completion of all restoration work (final grading and seeding).

<u>Comment Letter 3. Douglas Robbins</u>

Comment 3A: Many home landowners in the Town of Denmark get their water supplies from the springs and wells that are just below the work that would be done in the Copenhagen Wind Farm Project. The commenter believes the proposed 2,500 feet stipulation for responsibly by the Project is not acceptable because the water for these homes travels downhill from the proposed Project

location. Before any work is commenced, he and many of his neighbors want assurance in writing that the Copenhagen Wind Farm will be responsible for any problems with drinking water that might occur from implementing and running the Wind Farm Project. It is important that any possible problems be solved to the homeowner's satisfaction.

Response 3A: As indicated in response to Comment 2B, a Hydrogeological Study was undertaken to assess the potential for impacts to groundwater resources from the proposed Project (see Appendix C). This assessment concluded that construction of the wind turbine foundations and transmission line should not result in a significant adverse impact to groundwater resources and water wells in the vicinity of the Project. See Section 2.2.2 of the FEIS, which includes new information about groundwater resources and water wells in the Project Area, as well as the potential impacts on these resources that could result from construction and operation of the Project. Section 2.2.2.3 of the FEIS updates the impact and mitigation discussions from the DEIS based on the revised Project layout and the results of the Hydrogeological Study.

With regard to resolving potential problems with adjacent wells and water supply, the Project Sponsor will implement a Complaint Resolution Plan to establish an efficient process by which to report and resolve complaints regarding construction or operational impacts (see Appendix G). Copenhagen Wind, LLC is committed to resolving concerns on a case-by-case basis. Upon receipt of a question or a concern, the Site Construction Manager or Plant Manager will contact the individual within 24 hours and work with them in good faith to resolve the issue. During the construction period, a copy of any complaint received by Copenhagen Wind, LLC will be provided to the on-site Environmental Monitor, who will provide input as necessary to resolve the complaint. During Project operation, records of complaints will be shared with local codes enforcement officials. If the on-site Project representative and the individual filing the complaint do not mutually agree that a concern has been appropriately addressed, the on-site representative will refer the concern to upper-management within Copenhagen Wind, LLC and to Town officials, who will continue to work with the individual to resolve the concern to their satisfaction.

<u>Comment Letter 4. Shari Simmons</u>

Comment 4A: There are still issues with where the line is going to be, where the towers are going to be, how they are going to do the windmills. We are talking about the aquifer that we have, the Tug Hill, the Northern Tug Hill Aquifer. The DEIS states that the Northern Tug Hill aquifer is the sole

source for six villages, and is highly susceptible for contamination due to soil type and ground source. Our water supply is very important, and we're all concerned about contamination. It's not just the Town of Denmark and the Town and Village of Copenhagen, but a large land mass.

Response 4A: See Responses to Comments 2B and 2C.

Comment 4B: The Commenter is concerned with how all of this can be completed when there are still so many issues up in the air. How can things be passed or voted on or allowed to progress when there are still several issues up in the air? There are a lot of things we don't have answers to yet, and a lack of communication between client and landowners affected by the Project. For example, the map shows a transmission line buried across the Commenter's property, but nobody's taken the time to com talk to them.

Response 4B: Copenhagen Wind Farm, LLC is committed to open and honest dialogue with all Project participants. As mentioned repeatedly in the FEIS, the Project Sponsor has devoted significant time and effort to revising the Project layout since the release of the DEIS. In many instances, layout revisions reflect the results of discussions and agreements with various Project participants, as well as a desire to avoid or minimize impacts on non-participating landowners. As a result of these discussions, all participating landowners should be aware of the Project layout as currently proposed, and in agreement with the location of proposed Project components on their properties. On-going communication with Project participants and adjacent residents will occur throughout Project permitting and construction to assure that landowner concerns/requests are understood and addressed. As indicated in Responses to Comments 3A, 7A, and 9Z, a Complaint Resolution Plan (see Appendix G) will be implemented to assure that landowner concerns are identified and addressed throughout Project construction and operation.

Comment 4C: Commenter is requesting more information on the location of the towers and transmission lines, and where dynamiting could potentially occur.

Response 4C: FEIS Figure 3 depicts the current location of all Project components, including wind turbines and transmission lines. In addition, a large-scale (poster size) version of this map is included as Appendix O. With regard to blasting, depth to bedrock in the Project area is variable and it

is likely that some turbine foundations will be set into bedrock. Prior to commencing construction, the Project Sponsor will perform subsurface geotechnical investigations at each proposed turbine site to determine site-specific bedrock conditions. Because most of the bedrock in the Project area is limestone, it is anticipated to be rippable, and will thus be excavated using large excavators, rock rippers, or chipping hammers. If the bedrock is not rippable, it will likely be excavated by pneumatic jacking or hydraulic fracturing. If these methods are not feasible, limited blasting may be used. If blasting is required to remove any bedrock, a detailed blasting plan will be prepared by the contractor for the Town Engineer's review. See Appendix C of the DEIS for a Preliminary Blasting Plan.

Comment 4D: Commenter requested more information about the substation and questioned whether there are potential health issues associated with the substation.

Response 4D: See Sections 3.10.1.7 and 3.10.2.2.7 of the DEIS, which address electric and magnetic fields (jointly referred to as electro-magnetic fields, or EMF). EMF is found wherever and whenever electricity is used, whether it is wiring, appliances, computers, power lines, or substations. Consequently, humans are regularly exposed to a wide variety of natural and man-made EMFs, both in the outdoor environment and in homes, schools, and businesses. EMFs decrease in size as the distance from the source increases. Numerous public health review groups, including the National Institute of Environmental Health Sciences (NIEHS), the National Institutes of Health, and the U.S. Department of Energy, have examined the public's exposure to EMFs produced by power lines. The consistent overall conclusion of these groups is that available data do not support a cause and effect relationship between exposure to environmental levels of EMF and elevated risk of disease. Specific to substations, "the strongest EMF around the outside of a substation comes from the power lines entering and leaving the substation. The strength of the EMF from equipment within the substations, such as transformers, reactors, and capacitor banks, decreases rapidly with increasing distance. Beyond the substation fence or wall, the EMF produced by the substation equipment is typically indistinguishable from background levels" (NIEHS, 2002). As shown on FEIS Figures 3 and 8, the Project substations are well removed from residential areas. The POI and collector substations are located approximately 840 and 1,350 feet from the nearest residence, respectively.

Comment 4E: Commenter questions what will be done with the logs from the trees cut down during construction.

Response 4E: Section 2.6.3 of the DEIS describes the site preparation process, including tree clearing: "Trees cleared from the work area will be cut into logs and stockpiled on the edge of the work area or removed from the defined work area, while limbs and brush will be chipped and spread in upland areas (safely away from water resources) on-site so as not to interfere with existing land use practices. Landowners will have the right to any materials, including trees, taken from their property during site preparation, and any trees not claimed by the landowner will be sold to a local forestry operation or timber mill."

Comment 4F: Commenter is concerned about the safety and health issues, such as electrocution or cancer, associated with underground transmission lines.

Response 4F: The potential health impacts associated with EMFs generated by the buried collection lines at the Project site are addressed in Section 3.10.2.2.7 of the DEIS. See also Response to Comment 4D, above.

Comment Letter 5. Gerald Carter

Comment 5A: These towers are going to be right on top of our aquifer and there's another one just north of the Village. They will drill down about 50 or 60 feet at the base of the towers, they are going to do a lot of blasting, there's going to be a lot of rock there. What kind of guarantee are we getting, that our water is not going to be disrupted? Water is very important to all of us. We don't need electricity, the Amish showed us that, we don't need it. We do need the milk, the bread, the wheat, and the water. We need the water.

Response 5A: See Responses to Comments 2B and 2C.

Comment Letter 6. Scott Simmons

Comment 6A: Commenter is concerned with the amount of money generated from the project for local governments, and expresses concern over its effect on local taxes, assessments, and property values.

Response 6A: Section 3.9.2 of the DEIS describes the anticipated impact of the Project on socioeconomics, including municipal budgets and taxes. It is estimated that the PILOT will be approximately $640,000 for year one, with an estimated 20 year total of $15,500,000. This annual revenue stream will be distributed among the relevant taxing jurisdictions according to their share of the local combined tax rates and pursuant to the terms of the PILOT Agreement. As with other sources of municipal revenue, each taxing jurisdiction will determine how these funds are to be allocated. Beyond increased sales tax receipts due to construction and operation expenditures, and the positive impacts stemming from the Project PILOT (as well as the eventual full taxation of Project infrastructure), the operation of the proposed facility is not expected to have any direct impact on the municipal tax bases in the area.

Comment 6B: The Commenter is concerned with lack of communication between client and landowners affected by the Project. He believes the developer should have a complete and final layout to be provided to land owners before signing off on the Project, and suggests that a person be situated at the Project site at all times to answer questions from the public. Two days a week isn't cutting it.

Response 6B: See Response to Comment 4B.

Comment Letter 7. Bernard and Mary Jones

Comment 7A: Commenters state that they have no opposition to the wind farm itself, but would like to go on record saying that they do have a concern with regard to the possibility of the towers interfering with satellite television and internet reception once the windmills are up and running. If there is interference, the Commenters expect OWN Energy to correct the problem.

Response 7A: As indicated in Section 3.12.2.2.2 of the DEIS, there is some potential for the Project turbines to disturb some available off-air television channels at some reception points in the area. However, cable and satellite coverage, likely the dominant mode of service delivery to the immediate area, will not be affected. Copenhagen Wind, LLC is committed to resolving any and all concerns on a case-by-case basis, including impacts to existing off-air television reception. The Project Sponsor will implement a Complaint Resolution Plan to establish an efficient process by which to report and resolve any construction or operational impacts (see Appendix G). Upon receipt of a question or a concern, the Site Construction Manager or Plant Manager will contact the individual registering the complaint within 24 hours and work with

them in good faith to resolve the issue. During the construction period, a copy of any complaint received by Copenhagen Wind, LLC will be provided to the on-site Environmental Monitor, who will provide input and assistance, as necessary, to resolve the complaint. During Project operation, records of complaints will be shared with local codes enforcement officials. If the on-site Project representative and the individual filing the complaint do not mutually agree that a concern has been appropriately addressed, the on-site representative will refer the concern to upper-management within Copenhagen Wind, LLC and to Town officials, who will continue to work with the individual to resolve the concern to their satisfaction.

Comment Letter 8. Matthew J. Brower, New York State Department of Agriculture and Markets

Comment 8A: The DEIS does not mention the potential for organic farm operations to be impacted by the Project. The Project Sponsor will need to determine if any of the farmland impacted by the Project is used for the production of organic crops. If so, a plan will have to be developed to prevent such farm operations from losing their organic certification.

Response 8A: The Project Sponsor in not aware of any organic farming operations within or adjacent to the Project area. The Northeast Organic Farming Association directory of certified organic operations in New York State was reviewed, as were other online resources. No organic farming operations were identified in the area (NOFA-NY, 2013; Farmer's Pal, 2013; Local Harvest, 2013).

Comment 8B: Transmission structures and guys create an obstacle for farm equipment operation and reduce the efficiency of such operations. The Project Sponsor should avoid placing transmission structures and guys in agricultural fields. The Project Sponsor should also review the proposed location of such structures and guys on-site with the Department of Agriculture and Markets and the landowner prior to final design. Where the placement of structures in agricultural fields is unavoidable, the Project Sponsor should use single pole structures and maximize pole heights and spanning distances to minimize the impact to agriculture.

Response 8B: Since the release of the DEIS, the transmission line design has advanced to the point where the location of guyed structures can be determined. Review of the current transmission line design indicates the presence of 60 guyed structures in active agricultural fields. The Project Sponsor consulted with landowners along the transmission on the location of guyed structures line and incorporated their feedback wherever possible. In most cases, these structures have

been located near field edges or corners where their interference with agricultural operations will be limited. An attempt has also been made to span fields whenever possible (given loading and clearance constraints). Prior to final design of the transmission line, the Project Sponsor will schedule a site visit with a NYS Department of Agriculture and Markets representative to review proposed pole locations and discuss means of further reducing/mitigating impacts to agricultural land and agricultural operations.

Comment 8C: On page 30 of the DEIS it states in Section 2.6.7 "installation of the buried electrical lines would typically require a width of up to 25 feet of vegetation clearing." In agricultural fields where 3 or more cables are installed in the same area or if an open trench is required for installation, topsoil stripping from the entire work area will be necessary. As a result, additional work space may be required.

Response 8C: To more accurately address potential impacts associated with the co-location of multiple circuits, the assumption used to calculate impacts from buried electrical gathering lines has been increased, from the 25-foot wide corridor of soil and vegetation disturbance per linear foot of collection line used in the DEIS to a 50-foot wide corridor used in the FEIS. Because it has been applied to all buried collections line segments, whether they have one, two, or three circuits, this 50-foot wide impact assumption represents a conservative value; on average, actual impacts are anticipated to be less. The Project Sponsor has committed to compliance with mitigation measures outlined in the NYSDAM Guidelines for Agricultural Mitigation for Wind Power Projects, including the stripping and stockpiling of topsoil along buried cable routes with three or more cables.

Comment 8D: Clearing and construction equipment traffic, particularly during wet soil conditions, can result in topsoil mixing and soil compaction in agricultural fields. Severe damage to agricultural fields can occur when the appropriate protection measures are not implemented. In order to protect the agricultural resources, the Project Sponsor should either: prohibit any clearing or construction equipment from crossing agricultural fields, place construction matting in areas of agricultural fields used for clearing and construction access, or strip the topsoil from the areas of agricultural fields that will be used for clearing and construction access. Also, following construction, subsoil decompaction should be completed with a heavy duty subsoiler or deep ripper in any areas of agricultural fields that are used for access.

Response 8D: The Project Sponsor has committed to compliance with the NYSDAM Guidelines for Agricultural Mitigation for Wind Power Projects, which include all of the measures described in this comment.

Comment 8E: Section 4.3 of the DEIS describes the Environmental Compliance and Monitoring Program, including the responsibilities of the Environmental Monitor. An additional responsibility of the Environmental Monitor should be to maintain regular contact with the affected farmers and the New York State Department of Agriculture and Markets concerning farm resources and management matters pertinent to the agricultural operations and the site-specific implementation of the construction and restoration guidelines.

Response 8E: Section 2.2.14 of the FEIS includes correspondence with affected farmers and NYSDAM as responsibilities of the Environmental Monitor.

Comment 8F: Please include the Department of Agriculture and Markets' windpower guidance document (attached) in the FEIS.

Response 8F: An earlier version of these guidelines were included in the DEIS as Appendix E. The updated July 2013 guidelines provided in the comment letter from NYSDAM are attached to the FEIS as Appendix K.

Comment Letter 9. Andrew Davis, New York State Department of Public Service

Comment 9A: The developer should show on a map the location of the 49 turbines. The statement that 49 turbines out of 62 will be used is vague.

Response 9A: At the time the DEIS was released, it had not yet been determined which of the 62 turbine sites under consideration would be selected. However, Section 2.1.2 of the DEIS explained how the final turbine sites would be determined: "Final wind turbine site locations will be selected based upon a balance of Project Sponsor objectives (such as wind optimization and landowner participation), with minimization of Project related impacts (such as sound, shadow flicker, and wetland/stream disturbance)." The FEIS identifies the 47 turbine sites that have been selected for Project construction. All DEIS figures that displayed the Project layout or Project site have been revised to reflect the current Project layout (i.e., FEIS Layout), and are attached to this FEIS.

Comment 9B: The DEIS states that proximity of proposed wind turbines to the Cortland County landfill is identified as a potential impact. No explanation is provided for this statement and the location of the landfill is not within an area of anticipated impact for the Project. Further explanation should be provided or the statement should be removed.

Response 9B: The reference to the Cortland County landfill in the Summary of Potential Impacts Table in Section 1.0 was in error, and a correction is included in Section 3.0 of the FEIS. The Copenhagen Wind Farm is located in Lewis and Jefferson Counties, and is not in proximity to any landfills.

Comment 9C: It is noted in the DEIS Executive Summary that the Applicant will utilize "best practice" construction techniques that minimize disturbance to vegetation, streams, and wetlands. What specific document contains "best practice" construction techniques? Commenter requests a copy of the "best practice" document.

Response 9C: See Section 3.1.3 of the DEIS, which provides examples of measures to minimize soil impacts:

> *"Impacts to soil resources will be minimized by adherence to best management practices that are designed to avoid or control erosion and sedimentation, stabilize disturbed areas, and prevent the potential for spills of fuels or lubricants. In addition, erosion and sedimentation impacts during construction will be minimized by the implementation of a SWPPP and associated erosion and sedimentation control plan developed as part of the State Pollution Discharge Elimination System (SPDES) General Permit for construction activities. Prior to construction, the Project Sponsor will be required to prepare a complete a SWPPP, which will describe in specific terms the erosion and sediment control practices that will be implemented during construction activities and the stormwater management practices that will be used to reduce the pollutants in stormwater discharges after Project construction has been completed.* ***edr*** *prepared a Preliminary SWPPP, which is attached hereto as Appendix D. The Preliminary SWPPP provides information on stormwater management practices, including erosion and sediment control (vegetative and structural measures, temporary and permanent measures), construction phasing and disturbance limits, waste management and spill prevention, and site inspection and maintenance. To mitigate any potential impacts associated with erosion and*

sedimentation, the Project contractor will, at a minimum, implement and adhere to the measures set forth in the Preliminary SWPPP provided in Appendix D."

See also Section 3.2.3 of the DEIS, which provides examples of measures to minimize impacts to streams and wetlands:

"Where crossings of surface waters and wetlands are required, the Project Sponsor will employ Best Management Practices associated with particular, applicable streamside and wetland activities, as recommended by the NYSDEC and the USACE, and required by the issued wetland/waters permits. Specific mitigation measures for protecting wetlands and surface water resources will include the following:

- *No Equipment Access Areas: Except where crossed by permitted access roads or temporary timber matting, wetlands, and streams will be designated "No Equipment Access," thus prohibiting the use of motorized equipment in these areas.*
- *Restricted Activities Area: A buffer zone of 100 feet, referred to as "Restricted Activities Area", will be established where Project construction traverses streams, wetlands and other bodies of water. Restrictions will include:*
    - *No deposition of slash within or adjacent to a waterbody;*
    - *No accumulation of construction debris within the area;*
    - *Herbicide restrictions within 100 feet of a stream or wetland (or as required per manufacturer's instructions);*
    - *No degradation of stream banks;*
    - *No equipment washing or refueling within the area; and*
    - *No storage of any petroleum or chemical material.*
    - *No disposal of excess concrete or concrete wash water.*
- *Access Through Wetlands: When crossing wetlands, routing around edges, utilizing higher ground, and crossing the narrowest portion of the wetland will be the preferred crossing options. Wherever feasible, low impact crossing methods will be used such as timber mats or similar materials. Geotextile mats, corduroy, and/or gravel may also be used to create temporary wetland road widening. Where permanent roadways are installed and impoundment of water is possible, the installation of properly-sized culverts will maintain the natural water levels/flows on each side of the road.*

- *Sediment and Siltation Control: A soil erosion and sedimentation control plan will be developed and implemented as part of the SPDES General Permit for the Project. To protect surface waters, wetlands, groundwater and stormwater quality, silt fence, hay bales, and temporary siltation basins will be installed and maintained throughout Project construction. Exposed soil will be seeded and/or mulched to assure that erosion and siltation is kept to a minimum along wetland boundaries. Specific control measures will be identified in the Project SWPPP, and the location of these features will be indicated on construction drawings and reviewed by the contractor and other appropriate parties prior to construction. These features will be inspected on a regular basis (minimum of once weekly) to assure that they function properly throughout the period of construction, and until completion of all restoration work (final grading and seeding)."*

Comment 9D: The actual impacts that will result from the Project are not fully quantified in a logical presentation. The DEIS should identify the Project layout proposed and assess impacts related to that layout and design.

Response 9D: It is true that the layout presented in the DEIS did not represent the final Project layout, and evaluated 62 potential turbine sites despite plans to only construct 49 turbines. See Response to Comment 9A. However, the DEIS thoroughly quantified impacts. See DEIS Table 1, which presents the areas of disturbance (vegetation clearing, along with permanent and temporary soil disturbance) for each Project component. Subsequent DEIS tables quantified specific impacts by resource category. For example, DEIS Table 8 presents impacts to vegetation and DEIS Table 39 presents land use impacts. Also note that the FEIS identifies the 47 specific turbine sites that have been selected for Project construction. All DEIS tables that summarized Project impacts have been revised to reflect the current Project layout (i.e., the FEIS layout), and are included in the appropriate sections of this FEIS.

Comment 9E: The EIS should report the results of the spring 2013 NYSERDA bid awards and indicate whether Copenhagen Wind was selected for RPS awards and indicate whether future awards will be pursued.

Response 9E: The Project Sponsor did not bid in the latest Tier 1 solicitation, but does anticipate participating in the next round of offerings.

Comment 9F: The proposed O&M building is located remotely from the other Project components, including the electrical collection substation. The DEIS does not address any needed communications links from the collection substation to utility transmission point of interconnection (POI) substation, or the O&M facility. Any facilities necessary to provide operations communications links, such as new fiber optic cables, microwave tower relays or other facilities should be reported and analyzed for environmental effects.

Response 9F: Communication between Project components will occur via fiber optic cables, which will be co-located with buried collection lines. The Project does not include any microwave tower relays or other similar facilities. The DEIS impact calculations (updated in this FEIS) fully account for all components and activities that will result in disturbance to soil, vegetation, and other resources within the Project area.

Comment 9G: Provide manufacturer's recommendations supporting the 642-foot setback from non-participating parcels and 1,500-foot setback from permanent residence, with exception by waiver.

Response 9G: The manufacturer's recommendations for turbine setbacks are discussed in Sections 3.10.2.2.1 and 7.0 of the DEIS, and are attached hereto as FEIS Appendix M.

Comment 9H: The wind turbine model selected comes in 80 meter and 100 meter tower heights. Will the shorter 80 meter tower model be used in any of the proposed tower locations? If so, provide the total turbine height of this smaller version of the turbine.

Response 9H: As described in FEIS Section 2.1, the size and capacity of the proposed turbines has been modified slightly since the release of the DEIS. The turbine proposed in the DEIS was the GE 1.6 - 100 wind turbine, while the currently proposed model is the GE 1.7 – 100 wind turbine. The GE 1.7 – 100 turbine has a rotor diameter of 100 meters (328 feet), and is mounted on a 96-meter (315-foot) tubular steel tower, for a total turbine height of 150 meters (492 feet). The same turbine model and dimensions will be used at all proposed turbine sites.

Comment 9I: Provide a diagram showing the proposed transforming substation components, layout and footprint, access and egress, and other pertinent details applicable to the proposed

transforming substation. Identify the location of any proposed isolation switchgear for the transmission facility (i.e. located at transformer station or interconnection station). Describe the proposed ownership of the transmission facilities and isolation switchgear.

Response 9I: Appendix A of the DEIS provides diagrams showing the layout of both the collection and POI substations, including the footprint, access/egress points, fence lines, equipment enclosures, and disconnect switch operators. See also DEIS Appendix B, which illustrates the appearance of typical wind farm substations. The POI substation will be owned and operated by National Grid. The Project Sponsor will own and operate the collection substation. Updated drawings of the substations are provided in FEIS Appendix L.

Comment 9J: Clarify whether there is any back up for the SCADA system in case of an emergency.

Response 9J: Section 2.5.3 of the DEIS indicated that the POI substation would house the command center of the Project's supervisory control and data acquisition (SCADA) system. This is incorrect; see Section 3.0 of this FEIS. The SCADA system will be operated from the O&M Facility. The GE SCADA system is designed with operational-based hardware redundancies so that the system can remain operating to specification should one of the strands of the fiber optic network go dark. In case of loss of power, backup will be in accordance with industry standards (e.g., battery and/or generator backup).

Comment 9K: Provide an explanation of why the Applicant has not committed to removing tower foundations if decommissioning is initiated.

Response 9K: As indicated in Section 2.8 of the DEIS, "Foundations at depths less than 42 inches below grade in non-agricultural land and 48 inches below grade in active agricultural land will be removed."

Comment 9L: Based on final configuration and turbine size, Table 3 may need to be revised to include New York State Department of Public Service, as an involved agency for issuance of Public Service Law Section 68 - Certificate of Public Convenience and Necessity in case the Project's capacity exceeds 80 MW.

Response 9L: The Copenhagen Wind Farm has a 79.9 MW interconnection request with the NYISO. There is no need to obtain a Certificate of Public Convenience and Necessity, because the Project's capacity will not exceed 80 MW.

Comment 9M: In Section 3.11.2, the DEIS describes the proposed construction activities for co-locations of the 115 kV transmission line in proximity of an existing high-pressure gas transmission line. The discussion of Operation and Mitigation do not address co-location considerations including induced voltage effects of electric transmission line on the gas transmission facility. To maintain operational integrity of the natural gas transmission line, the proposed Project should be reviewed by the pipeline facility owner, Niagara Mohawk Power Corporation - National Grid. Based on the review, appropriate design mitigation should be incorporated into construction and operations plans to avoid conflict with the safe and reliable operation of the gas transmission pipeline.

Response 9M: Since the release of the DEIS, the Project layout has been refined (see FEIS Figure 1) to reduce Project impacts. The length of the transmission line has been reduced from approximately 10 miles to 9 miles, and the current design no longer crosses the existing high-pressure gas transmission line.

Comment 9N: The electric transmission line will be co-located in part along the location of an existing Niagara Mohawk Corporation - National Grid electric transmission facility. The proposed Project should be coordinated with the electric transmission owner-operator engineering and right-of-way department for review and avoidance of conflicts with the safe and reliable operation of the existing electric transmission line.

Response 9N: The portion of the transmission line that will be co-located with an existing Niagara Mohawk - National Grid electric transmission facility comprises five pole locations and the POI substation. The Project Sponsor will coordinate with the appropriate departments to avoid conflict with or disruptions to the safe and reliable operation of the existing electric transmission line.

Comment 9O: The PSC has established a policy regarding wind turbine structure locations near electric transmission facilities. In an Order granting Certificate of Public Convenience and Necessity in Case 07-E-0213, issued January 17, 2008, the Commission indicated that in the future, it may,

"as conditions warrant require a minimum set back distance of 1.5 times the maximum turbine blade tip height from the edge of the right-of-way of any electric transmission line designed to operate at 115 kV or more." Turbine 53 and 54 depicted at various Project layout maps in the DEIS are proposed closer than this setback distance from the proposed 115 kV transmission interconnection line. The FEIS should provide a detailed assessment of the precise facility locations, and should provide an analysis demonstrating compliance with this setback requirement for all turbines from all existing and proposed electric transmission facilities.

Response 9O: As illustrated in Figure 1, the Project layout has been updated since the release of the DEIS. Due to the relocation of the collection substation and associated shifts in the proposed transmission line route, the current location for Turbine 54 is now approximately 1,740 feet from the edge of the proposed transmission line ROW, and approximately 1,615 feet from the fence line at the collection substation, well beyond the setback that the PSC was considering in 2008. The current location for Turbine 53 is approximately 700 feet from the edge of the transmission line ROW and approximately 570 feet from the fence line at the collection substation. This is less than 738 feet, the distance equivalent to 1.5 times the total turbine height. However, it was sited at this location, in part, at the request of the landowner. None of the other turbines are sited within 738 feet of the substation or the edge of the proposed transmission line ROW. Furthermore, it should be noted that all turbine locations comply with the manufacturer's recommended setback of 1.1x the total turbine height (i.e., 541 feet) for electrical transmission systems. See Appendix M.

Comment 9P: In Section 3.13.1, the land use assessment identifies "Vacant Land" as a major land use category. Vacant land is generally an indication that a parcel has no taxable development or structures, such as forest land, unimproved pasture land, old field, wildlife habitat, recreational land. The analysis of use impacts should include an analysis of actual uses, functions of and activities occurring on currently undeveloped property that may be affected by Project development.

Response 9P: Table 37 of the DEIS summarizes property class codes in the Town of Denmark, as determined by the local property assessment authority and the New York State Office of Real Property Tax Services (NYSORPTS), in accordance with the guidance of the New York State Department of Taxation and Finance. Data regarding property class distributions at the municipal level are made available through the NYSORPTS' Municipal Profiles website

(http://orpts.tax.ny.gov/cfapps/MuniPro/). The distribution shown within Table 37 of the DEIS is summarized by the nine principal use categories, one of which is vacant land. According to the 2013 Annual Assessment of Rolls Parcel Count, there are a total of 298 vacant parcels in the Town of Denmark. A more detailed description of the land uses of these vacant parcels is provided below:

Property class code	Property class	Parcel Count
311	Residential vacant land	115
311W	Residential waterfront vacant land	11
312	Residential land including a small improvement (not used for living accommodations)	38
312W	Residential waterfront land including a small improvement (not used for living accommodations)	2
314	Rural vacant lots of 10 acres or less	29
321	Abandoned agricultural land	57
322	Residential vacant land over 10 acres	22
323	Other rural vacant lands (e.g., waste lands, swamps, noncommercial woods and brush)	4
330	Vacant land located in commercial areas	13
331	Commercial vacant land with minor improvements	5
380	Public utility vacant land	2

There are 18 parcels within the Project area totaling 515 acres (5.6 %) that are classified as vacant land by the NYSORPTS. Of those, 13 parcels totaling 406 acres (79%) are vacant residential land (property classes 311, 312, and 322), and five parcels totaling 109 acres (21%) are vacant agricultural land. In regard to actual land use occurring on parcels designated as vacant land, it is reasonable to assume that these are generally restricted to outdoor recreation (e.g., hunting, fishing, snowmobiling, etc.) and property maintenance/management (e.g., logging, mowing, firewood cutting, etc.). For the most part, such activities will not be adversely affected by the proposed Project. Direct impacts of the Project (physical disturbance of the property) will only occur on the properties of landowners voluntarily participating in the Project. In some cases, provision of access road or clearings on vacant land can enhance the landowners' desired use of the property.

Comment 9Q: In Section 3.13.3, the EIS discussion should be expanded to provide an analysis of the acreage of all Ag District lands that will be affected by the proposed Project, indicating areas of temporary impact and permanent loss of both agricultural and farm woodland areas that are enrolled in the Ag District Program pursuant to Article 25-AA of the Agriculture and Markets Law; or a description of how the Project plans will minimize impacts on agricultural district lands to the maximum extent available.

Response 9Q: See FEIS Table 15, which has been added to quantify impacts to State-designated Agricultural District lands. See also FEIS Table 5, which quantifies the acreage of agricultural soils impacted by the current layout (i.e., soils classified as Prime Farmland and Farmland of Statewide Importance). As described in Section 3.13.3 of the DEIS, the Project Sponsor will minimize impacts on active agricultural land and farming operations by complying with the guidelines established by the New York State Department of Agriculture and Markets as defined by the Guidelines for Agricultural Mitigation for Wind Power Projects. The 2013 revised guidelines are included as FEIS Appendix K. Note that these guidelines are intended to mitigate impacts on all agricultural lands, not only those agricultural lands located within agricultural districts. The revised Project layout also reduces impacts on forest land, including any farm woodland areas that may be enrolled in the Agricultural District Program.

Comment 9R: The discussion of the 115 kV transmission line does not indicate the proposed forest land clearing width within the temporary construction or permanent operational right-of-way; or the vegetation clearance requirements for the transmission facilities, including the 115 kV line and the substation facility.

Response 9R: Section 2.6.11 of the DEIS presents a summary of anticipated disturbance to soil and vegetation for each Project component. As indicated therein, a 100-foot wide corridor will be cleared to create the transmission line right-of-way, 50 feet to each side of the center line. The ROW will be maintained at this width to accommodate both construction and operation of the transmission line. During operation, the ROW will be maintained in low-growing vegetation (generally less than 20 feet) to assure safe conductor clearances. Two acres will be cleared for the collection substation, and 1 acre for the POI substation.

Comment 9S: Provide the setback distances of the turbines from various receptors such as residences, public roads, school, play grounds, etc. The FEIS should provide an analysis of whether the

proposed setbacks conform to both the turbine manufacturer's specifications and local setback requirements.

Response 9S: Section 3.13.1.2 of the DEIS describes setbacks from various receptors, including public roads, residences, public buildings, campgrounds, churches, businesses, schools, and non-participating parcels. Since the DEIS was released, setback requirements for turbines as required by the Town of Denmark Zoning Law have been amended. Consequently, an updated analysis of setback distances is provided in Section 2.2.13.1.2 of the FEIS. In summary, Project facilities will comply with setback requirements as outlined in the local zoning laws. The facilities will maintain minimum setback of 642 feet from the centerline of non-seasonal public roads, and from the property lines of all adjacent parcels owned by non-participating neighbors except by way of waiver. In addition, except by way of waiver, the turbine locations will maintain a minimum setback of at least 1,500 feet between the tower location and adjacent residential, public, campground, church, or business structures, and at least 1,500 feet from school property lines. The consistency of setbacks with the manufacturer's specifications are addressed in Sections 3.10.2.2.1 and 7.0 of the DEIS. All setbacks are consistent with the manufacturer's recommended guideline distance for safety and have also been assessed by the Project Sponsor as being acceptable.

Comment 9T: The discussion of soils in DEIS Section 3.1 includes the following conclusion regarding erosion hazard: "This is limited to several small areas along the transmission line corridor, the location of Turbine 15, the access road approaching Turbines 36 through 38, and a small section of buried interconnect between Turbines 43 and 46." Facility components are not illustrated on Figure 4. Review of Figures 3A, 5A, 6A, and 8A reveal that there is no Turbine 43 site evident. The description is likely in reference to Turbines 42 and 46. The assessment of steep slopes and soils limitations including erosion hazard warrants additional consideration and analysis.

Response 9T: The Commenter is correct that there was no Turbine 43 included in the DEIS layout. The quoted excerpt should have ended with reference to the section of buried interconnect between Turbines 42 and 46. See Section 3.0 of this FEIS for corrections to errors in the DEIS. FEIS Figure 4 depicts Project components, along with soil series and contours. The assessment of steep slopes and soils limitations has been updated in the FEIS (see Section 2.2.1).

Comment 9U1: The electrical collection lines for the eastern half of the Project are apparently co-located at one crossing point of the Deer River east of the Deer River Road crossing. At this crossing the lines will cross soils labeled as NfD(Rock Outcrop-Farmington Complex, 15 to 35 percent slope) and HbD (Herkimer Silt Loam, slopes from 15 to 25 percent). These are steep slope conditions adjoining the major water resource in the area. This location warrants additional analysis of soils conditions and limitations, and appropriate facility design and construction controls for minimizing environmental impacts to the Deer River tributary.

Response 9U1: Since the release of the DEIS, the Project layout has been refined (see FEIS Figure 1). The section of collection line referred to in Comment 9U1 has been re-designed and brought above ground, where it will span over the Deer River gorge. This short section of overhead line will protect an ecologically sensitive resource and address on-site constructability constraints. It will avoid soil disturbance and the potential for erosion impacts on the steep slopes adjacent to the river, and minimize the potential for sedimentation impacts to the waters of the Deer River.

Comment 9U2: If the proposal is for an overhead crossing of the Deer River, then consideration of design and mitigation measures to minimize visual impact in this area near the scenic gorge north of Copenhagen Village should be developed to inform decision-making.

Response 9U2: The gorge on the Deer River is located southeast of Cataract Street/Deer River Road, near the northeastern boundary of the Village of Copenhagen. There is no formal or informal overlook or access point that provides views of the gorge to the public. Open views are only available from private land along the gorge rim or from the bed of the river itself. Thus, views of the line will be restricted to the cleared ROW at the proposed crossing location. Consequently, the Project's impact on scenic views of the gorge should be limited.

Comment 9V: Detailed maps of the Project site soils depicting all Project facilities should be submitted. The current maps are not sufficient to relate Project layout to soils resources and limiting factors that may influence design of facilities and appropriate mitigation measures.

Response 9V: See FEIS Figure 4, which is a revision and expansion of DEIS Figure 4. The scale has been increased to show greater detail, and the ESRI base mapping has been replaced with 10-foot contours. Project components have also been added to FEIS Figure 4.

Comment 9W: The EIS should include mapping of the Project area showing the boundaries of the sole source and principal aquifers identified in the DEIS and the layout of the proposed Project facilities and infrastructures. The map should also depict springs/seeps within these aquifer zones, locations of public and private water supply wells, locations of drinking water source streams (i.e., Deer River) and locations of water supply intakes from drinking water source streams.

Response 9W: See Figure 5 of Appendix C for mapping of sole source and principal aquifers overlaid with Project components. Confirmed well locations were identified in a Hydrogeological Study prepared by Haley & Aldrich, and are mapped on Figure 2 of Appendix C. Wetlands and streams, including the Deer River, are depicted on FEIS Figure 5. No data are available regarding the location of seeps and springs (outside of those associated with the delineated/mapped wetlands) or the location of water supply intakes.

Comment 9X: The EIS should include detailed description of drinking water resource impacts mitigation measures that will be implemented for the Project, including explanations for the selection and proposed siting of facility structures and infrastructure in close proximity to any sources of drinking water.

Response 9X: Since the release of the DEIS, Haley & Aldrich performed a study evaluating drinking water resources in the Project area (see Appendix C). According to that assessment, construction of the wind turbine foundations and transmission lines will not result in a significant adverse impact to the groundwater resources in the vicinity of the Project. Construction activities will be sited away from existing residential water wells and surface water features. There are 100 parcels with residences located within 2,500 feet of a proposed turbine, but no residences within 1,000 feet of a turbine site. The majority of the construction will involve only shallow soil and/or bedrock excavation, generally within eight feet or less of the existing ground surface. Turbine foundation construction could potentially involve deeper excavation, depending on the subsurface conditions. The construction would involve commonly-utilized construction methods such as placement of steel reinforced concrete and shallow trenching. Such work would be designed and constructed in a manner which keeps disturbance localized, and utilizes best management practices to assure little or no impact to groundwater resources. See also Section 2.2.2 of the FEIS, which includes new information about water resources in the Project area, and updates the impact and mitigation discussions from the DEIS based on the revised Project layout and the results of the Hydrogeological Study.

Comment 9Y: The EIS should include plans for pre-construction groundwater monitoring of the Project area to determine the direction of groundwater flow in the overburden and bedrock aquifers and assess water quality conditions in areas where groundwater is expected to be encountered during construction and groundwater contamination is known or suspected. Describe the methods for preventing contamination and/or spread of existing contaminated materials within the boundaries of the Northern Tug Hill sole source aquifer during Project construction and maintenance.

Response 9Y: The Hydrogeological Study prepared by Haley & Aldrich evaluated drinking water resources in the Project area (see Appendix C and related discussion in Section 2.2.2). Based on that assessment, construction of the wind turbine foundations and associated Project infrastructure is not anticipated to result in a significant adverse impact to the groundwater resources in the vicinity of the Project. In addition, various best management practices to protect groundwater are proposed in the DEIS and recommended in the Hydrogeological Study. These measures include construction oversight by an Environmental Monitor, along with implementation of a Stormwater Pollution Prevention Plan; a Spill Prevention, Control, and Countermeasure Plan; an approved Blasting Plan (if blasting is required); and various erosion and sediment control measures. As a further groundwater well mitigation measure, the Project Sponsor previously committed to conducting structural, water quality, and water quantity inspections before and after construction of any wells that occur within 500 feet of proposed wind turbines (see Section 3.2.3 of the DEIS). However, due to setbacks from residences, no such wells were identified in the Hydrogeological Study. Any impacts identified through these inspections will be addressed on a case-by-case basis and appropriately mitigated through oversight of the Environmental Monitor. Therefore, additional pre-construction testing of well water and groundwater directional modeling are not considered necessary.

Comment 9Z: The Project Sponsor should provide preliminary emergency response plan, safety plans, and complaint resolution plans in the FEIS along with other mitigation plans.

Response 9Z: A complaint resolution plan is included as Appendix G to the FEIS. During construction, safety plans will be developed by the individual contractors working on the Project. These plans will be provided to all construction personnel and presented during pre-construction training session. Safety training and monitoring will be conducted by the contractor's on-site safety

officers(s). As indicated in Section 3.10.3.2.4 of the DEIS, a Fire Protection and Emergency Response Plan will be developed in consultation with local emergency service providers. Although discussions with emergency service providers have been initiated, formal plans have not yet been finalized.

Comment 9AA: The DEIS states that the 34.5 kV electrical collection system will include up to 24 miles of electrical collector lines. The 34.5 kV lines are likely to be arranged in several circuits, given the number of turbines proposed. The length of the lines is not supported with a routing diagram or analysis that shows the individual circuits. Thus there is no means of assessing the reported number of circuit miles, or the extent of locations where multiple circuits will be co-located in parallel. Multiple circuits will influence the number of passes or trenches needed to install the collection lines underground, structures needed to accommodate overhead collection lines, ROWs, as well as potential impacts.

Response 9AA: FEIS Figure 11 illustrates the individual circuits to be constructed for the electrical collections system. It is true that multiple circuits co-located in parallel will require additional trenches, and three parallel circuits would result in greater disturbance than a single circuit. However, co-locating circuits reduces overall impacts because three circuits side-by-side would result in less overall impact than three single circuits located separately. To more accurately address potential impacts associated with the co-location of multiple circuits, the assumption used to calculate impacts from buried electrical gathering lines has been increased, from the 25-foot wide corridor of soil and vegetation disturbance per linear foot of collection line used in the DEIS to a 50-foot wide corridor used in the FEIS. Because it has been applied to all buried collections line segments, whether they have one, two, or three circuits, this 50-foot wide impact assumption represents a conservative value; on average, actual impacts are anticipated to be less.

Comment 9BB: The DEIS assessment does not address the primary impacts, noise and visibility, that are likely to result from siting and operation of the electrical collection substation. Electrical transformers raising line voltages from 34.5 kV to 115 kV are generally associated with operational noise including tonal characteristics or "humming" sound. The Sound Assessment for the Project does not mention the substation or provide an assessment of operational noise levels or potential for tonal noise generation. Supplemental information should be provided to characterize impacts and identify appropriate mitigation measures.

Response 9BB: Since the release of the DEIS, the proposed location for the substations have changed, reducing potential impacts to nearby residences (see FEIS Figure 1). The collection substation is currently proposed for the same general area as in the DEIS, but is now set well back from NYS Route 12, approximately 1,350 feet from the nearest residence, and partially screened by trees. The POI substation is now located approximately 7 miles west of the generating site, in an open field approximately 840 feet from the nearest residence. Noise impacts from substations were not specifically evaluated in the noise assessment because substation sound has not been identified as an issue of concern at other operating wind projects in New York State. Field observations by the authors of the noise assessment indicate that although a slight hum can sometimes be discerned at the fence immediately around the substation, the step-up transformers (the only appreciable source of sound at a substation) are generally not a significant noise source.

In response Comment 9BB and other concerns about potential noise from the substations, the sound emissions from the step-up transformer were calculated at the nearest residences (approximately 840 feet from the POI substation). The sound power level of the transformer was derived from its megavolt ampere rating using empirical algorithms for calculating the sound emissions from power industry equipment published by the Edison Electric Institute in the Electric Power Plant Noise Guide. This sound power, including the frequency content in octave bands, is then projected to 840 feet based on ISO 9613-1 Acoustics – Attenuation of sound during propagation outdoors. The result of this calculation shows that the overall sound level at the nearest residences is expected to be about 36 dBA, which is essentially equivalent to normal environmental background sound levels in rural areas. Moreover, the A-weighted frequency content, plotted at the bottom of the analysis, demonstrates that the characteristic humming sound, principally occurring in the 125 Hz octave band, will be at an extremely low magnitude of about 25 dB, meaning that it will be insignificant relative to the mid-frequency sound around 1,000 Hz that is more dominant at that distance. In summary, the very low levels of sound that will be generated by the substations are not anticipated to have any adverse impacts on residential receptors in the area.

Potential visual impacts of the substations have also been minimized by relocating them away from adjacent residences. The combination of distance and existing vegetation that will provide screening should minimize any visual or noise impacts associated with the

substations. Appendix L of the FEIS provides updated diagrams showing the layout of both the collection and POI substations. See also DEIS Appendix B, which illustrates the appearance of typical wind farm substations.

Comment 9CC: The location of the proposed collection substation is near several residences located at NYS Route 12. The proximity should be anticipated to present potential concerns including operational noise effects and potential for complaints from nearby residents. Some consideration of the appearance of the substation and associated transmission lines from the residences should be provided in assessing Project impacts.

Response 9CC: Since the release of the DEIS, the proposed location for the collection substation has changed, reducing potential impacts to nearby residences. As illustrated in FEIS Figure 1, the new site for the collection substation is located in the same general area, but is set well back from NYS Route 12, and partially screened by trees. The access road for turbines 53 and 54 will extend to service the collection station, which is now located approximately 1,350 feet from the nearest residence. See also DEIS Appendix B, which illustrates the appearance of typical wind farm substations.

Comment 9DD: Given the uncertainty of the location of the 115 kV transmission line, in Section 5.2.5 the Lead Agency should require the developer to identify alternative locations for the collection substation, and identify appropriate mitigation based on analysis of both visibility and sound generation potential of the substation and these effects on nearby residences.

Response 9DD: Since the DEIS was released, the location for the 115 kV transmission line has been finalized, along with the locations for the collection and POI substations. In addition to the site considered for the collection substation in the DEIS, the Project Sponsor also considered an alternative site along Plank Road and the currently proposed site. The current location for the collection substation was selected as the best option, since it minimizes potential impacts to nearby residences. See FEIS Figure 1, which compares the FEIS layout to the DEIS layout. See also Responses to Comment 9BB, which addresses potential noise impacts from the substation; and Comment 9CC, which describes the current site for the collection substation.

Comment 9EE: The 115 kV line makes a sharp angle turn at a location within NYS Regulated Wetland RU-25. The angle is acute and atypical of major transmission facilities, and the location of this

excessive turn within a wetland area warrants additional design consideration. Angle turns on lines of this size require significant degrees of anchoring to provide necessary stability of the support structure to counter the tension on the structure from the electrical conductors. Anchoring options at a wetland location will require significant accessibility needs, for large equipment such as a concrete delivery vehicle, and wire-pulling rigs.

Response 9EE: Since the release of the DEIS, the proposed route of the transmission line has changed (see FEIS Figure 1), and there is no longer an angle turn within NYS Regulated Wetland RU-25 (see FEIS Figure 5). There is still a turn in the line nearby, but the angle is no longer acute, and it is located more than 100 feet beyond the wetland boundary.

Comment Letter 10. **David A. Stilwell, United States Fish and Wildlife Service**

Comment 10A: Note that the Summary of Impacts Table erroneously includes the "proximity of proposed wind turbines to the Cortland County landfill."

Response 10A: Comment noted. See FEIS Section 3.0, which includes acknowledgement of and correction of this error.

Comment 10B: USFWS recommends that Summary of Mitigation Measures Section of the Executive Summary should discuss the Project commitments currently being developed in a separate Avian and Bat Protection Plan document.

Response 10B: Mitigation measures for potential impacts to birds and bats are described in Section 3.3.3.2 of the DEIS, including post-construction monitoring and a habitat displacement study. See also Section 2.2.3.3 of this FEIS, which describes additional mitigation measures, including discussion of Avian Power Line Interaction Committee (APLIC) guidelines and a Habitat Conservation Plan (HCP), to be prepared in consultation with the USFWS. The HCP will address potential impacts to Indiana bat and other species proposed for listing. It is anticipated that various mitigation measures, including use of a cut-in speed that reduces bat mortality, will be considered as part of the HCP.

Comment 10C: On page 6, the DEIS states that the Project could operate at 35 percent of its nameplate capacity. Nameplate capacity is the maximum amount of electricity that a Project could generate under ideal conditions. However, the document does not mention that many wind

energy Projects in New York only generate a fraction of the nameplate capacity. Data from the NYISO indicate that most New York wind energy Projects fail to generate more than 23 percent of their nameplate capacity (NYISO 2011). The claim of electricity produced by the Project should be clarified and substantiated.

Response 10C: It is true that wind energy Projects in New York are currently generating power at an averaging capacity factor of approximately 25.5% (NYISO, 2013). However, due to improvements in turbine technology, along with greater hub heights and rotor swept zones, there is a trend of increasing capacity factors. Because the average capacity factor achieved in New York State includes many older facilities, this average is not indicative of what could be achieved at the proposed Project. According to the USDOE (2013), average capacity factors have been higher on average in more recent years (e.g., 32.1% from 2006–2012 versus 30.3% from 2000–2005), and some Projects built in 2010 and 2011 have achieved average capacity factors above 50%.

Comment 10D: Section 5.1 provides some discussion about alternative Project areas, but does not go into extensive detail about the decision-making process involved with the final selection of the Project location. USFWS encourages the Project Sponsor to review and apply "U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines" (USFWS 2012) during the design of the Project.

Response 10D: The Project Sponsor has reviewed the U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines and applied the principals outlined therein to the siting of the Copenhagen Wind Farm. The Guidelines advocate the use of a tiered approach for assessing potential adverse effects to species of concern. The three pre-construction tiers have largely been completed (i.e., preliminary site evaluation, site characterization, and field studies to document site wildlife and habitats and predict impacts). This process has led to the conclusion that species of concern may be present, but that there is a low probability of significant adverse impacts (see Section 3.3.2 of the DEIS and Section 2.2.3.2 of this FEIS). The last step of the Tier 3 process, identifying ways to mitigate potential direct and indirect impacts of building and operating the Project, is currently underway. Copenhagen Wind, LLC has committed to preparing a HCP to address potential impacts to Indiana bat and other species proposed for listing. Various mitigation measures will be considered as part of the HCP, which will be developed in consultation with the USFWS.

Comment 10E: There are several situations where underground installation is considered "infeasible due to constraints such as rivers, streams, or creek crossings, bedrock, etc." USFWS recommends that the Final EIS analyze the use of horizontal boring or horizontal directional (HDD) drilling methods for stream crossings.

Response 10E: Since the release of the DEIS, the Project layout has been refined (see FEIS Figure 1). To address specific instances where underground installation is infeasible, two sections of collection line will be brought above ground and span over streams and other sensitive features. In both cases, these spans will cross steep ravines and associated streams (Deer and Stony Creeks), and the short sections of overhead line will reduce impacts to ecologically sensitive resources and address on-site constructability constraints. These spans will greatly reduce the amount of erosion, sedimentation, and wetland impacts that could occur if overhead spans of the ravines/creeks were not utilized. In addition, the Applicant is also considering horizontal directional drilling and will use this method to reduce impacts where appropriate and practical. Example of such locations could include perennial streams with high water flow, and very mucky wetlands were equipment would cause excessive disturbance. In some cases, a final determination of where to use directional drilling may be made by the Environmental Monitor, depending on seasonal site-specific conditions (e.g., amount of recent rainfall).

Comment 10F: No mention is made of whether the nine-mile-long overhead transmission line can be collocated with other utility rights-of-way to limit environmental impacts.

Response 10F: There are no existing utility right-of-ways in which the transmission line could be co-located that would allow electricity generated by the Project to be delivered efficiently to the existing power grid. Since the DEIS was released, the location for the 115 kV transmission line has been altered to minimize impacts, reducing the total length from 9.8 miles to 8.8 miles.

Comment 10G: Three permanent meteorological towers will be built - either guyed galvanized tubular or lattice steel structures. Birds are known to collide with support wires resulting in injury or death. USFWS recommends a monopole design where no guy wires are used to support the structure. In addition, the towers should be as short as possible since the risk of avian collision increases with tower height.

Response 10G: The Applicant has re-evaluated the option for meteorological towers and is committed to avoiding the use of guy wires with a free-standing lattice tower design. This will minimize potential avian mortality by eliminating collisions with guy wires. However, the proposed height of the meteorological towers, 100 meters, must be retained. As indicated in Section 2.5.5 of the DEIS, the purpose of the meteorological towers is to collect wind velocity and directional data. To support meaningful performance testing for the turbines, the meteorological data must be collected at hub height.

Comment 10H: To avoid removing trees when Indiana bats and other roosting bats may be present, tree removal should occur between October 31 and March 31, when they have returned to their hibernaculum. These dates will also minimize the take of nests of migratory birds.

Response 10H: As indicated in Section 3.3.1.2.6 of the DEIS, use of the Project area for roosting by Indiana bats is considered unlikely. However, to minimize potential impacts on tree roosting and nesting wildlife species (including Indiana bats, birds, other bat species, and arboreal mammals), the Applicant will schedule tree clearing during the hibernation period for Indiana bat (i.e., November 1 to March 31).

Comment 10I: It is noted that a 100-foot-wide corridor will be cleared of vegetation for construction of turbine access roads. USFWS believes that in most situations this represents an excessive amount of vegetation removal. Other New York wind energy projects have specified widths of 60 feet (e.g., Rolling Upland, Stony Creek). Limiting the amount of vegetation clearing will reduce habitat disturbance and loss.

Response 10I: A conservative assumption regarding clearing width along access roads was used when calculating impacts, so as to not underestimate potential impacts to vegetation. To safely accommodate the passage of large erection cranes, a travel surface approximately 40 feet wide is typically required. Graded shoulders on either side of the road and allowing adequate area to stockpile stripped topsoil and cleared vegetation (e.g., log piles) could result in cleared areas up to 100 feet wide in some areas. During actual construction, no more vegetation will be cleared than is necessary to build the road and safely accommodate construction vehicles. In most cases, this is likely to be in the 60 to 80 foot range. However, for the purposes of potential impact evaluation in the FEIS, a “worst case” assumption of 100 feet was used.

Comment 10J: The DEIS states that the wind turbines will be operating when the wind speeds are within the operating range (3m/s - 25m/s). USFWS recommends operating turbines during periods when there is lower risk for causing fatalities to bats. For example, at night between the months of April to October, USFWS recommends operating turbines during wind speeds when limited bat activity is likely to occur.

Response 10J: To address concerns over potential impacts to Indiana and other rare bats, Copenhagen Wind Farm, LLC will be applying for an Incidental Take Permit from the USFWS and preparing a Habitat Conservation Plan (HCP). The HCP will include mitigation measures to be developed in consultation with the USFWS. Such measures could include seasonal tree cutting restrictions and curtailment of operation at night during low wind conditions to reduce bat mortality. The Project Sponsor is committed to implementing the range of mitigation measures described in FEIS Section 2.2.3.3.

Comment 10K: USFWS encourages coordination with the NYSDEC to determine whether an incidental take permit for any state-listed species may be needed.

Response 10K: The Project Sponsor has had ongoing consultations with the NYSDEC with respect to potential impacts to state-listed species. The NYSDEC also provided comments on the DEIS (see Comment Letter 11). The comments provided by the NYSDEC have not indicated the need for an incidental take permit for state-listed threatened and endangered species, and based on the discussion on Sections 3.3.2.2.3 of the DEIS, there is no indications that an Article 11 permit will be necessary.

Comment 10L: USFWS recommends the description of their involvement to state "Coordination and/or consultation pursuant to the Endangered Species Act."

Response 10L: Comment noted. See Section 3.0 of the FEIS, which provides corrections to errors in the DEIS, and includes the description of the USFWS's involvement in the Project as recommended in Comment 10L.

Comment 10M: Section 3.2.2.1.1 includes several siting criteria designed to avoid or minimize permanent impacts to streams and wetlands. USFWS recommends the colocation of access roads and

buried electrical interconnect lines to minimize disturbance to wetlands. USFWS also recommends addressing how the Project will avoid introduction or spread of non-native invasive plant species in Section 3.2.

Response 10M: As shown on Figure 3, access roads and buried electrical collection lines have been collocated wherever feasible. In general collection lines are only sited apart from access roads when doing so reduces impact (e.g., collecting from separate turbine strings not connected by access roads). Controlling the introduction and spread of invasive species will be conducted in accordance with the Invasive Species Control Plan (see Appendix E).

Comment 10N: Approximately 0.53 acre of permanent impacts and 14 acres of temporary impacts to wetlands/streams are currently anticipated as part of the Project construction. Wetland delineation has not been completed. Once more definitive wetland boundaries are known, the DEIS should be revised to reflect a more accurate impact assessment. Since a majority of the wetlands in the Project area are forested, this section should address the potential for fragmentation due to construction activities.

Response 10N: Since the release of the DEIS, a comprehensive field delineation of wetlands in the vicinity of proposed Project components has been performed (see Appendix B). Results of the wetland delineation are summarized in Section 2.2.2.1 of the FEIS. Based on the wetland delineation and current Project layout, wetland impacts will total 11.1 acres. The vast majority of these impacts (10.95 acres) will be temporary in nature, and subject to restoration following the completion of construction. Only 0.15 acre of wetland will be permanently impacted by Project construction (i.e., filled). Of the 11.10 acres of total impact, 6.42 acres will occur in forested wetlands; 0.41 acre will be allowed to regenerate, while 6.01 acres will be converted to successional communities (i.e., forest conversion impact). See Section 2.2.2.2 of the FEIS for more information about anticipated impacts to wetlands and streams.

Comment 10O: The DEIS suggests that the Project Sponsor will develop an on-site or off-site compensatory mitigation Project, ranging from creation of in-kind wetland to contribution to an agency-approved mitigation bank or in-lieu fee program. Mitigation should be provided for any conversion of forested wetlands to another vegetation community type. The USFWS will provide comment to the USACE when the mitigation plan is made available.

Response 10O: As indicated in Section 3.2.3 of the DEIS, any required compensatory mitigation will be developed in consultation with the NYSDEC and USACE, and will address conversion of forested wetlands to other vegetative community types. A specific mitigation proposal will be included in the Joint Application for Permit that will be submitted to the NYSDEC and USACE following completion of the SEQR review process. Input on proposed mitigation is anticipated from all agencies (including the USFWS) during the wetland permitting process.

Comment 10P: The DEIS provides details about methods to avoid/minimize impacts to wetlands and surface waters. USFWS recommends considering horizontal boring or HDD as an option to further minimize impacts. USFWS also recommends addressing invasive species in this section.

Response 10P: HDD boring will be utilized to cross wetlands and streams that would otherwise be adversely impacted by trenching. Sites selected to be candidates for the boring procedure will be identified during the wetland permitting process based on existing hydrological and soil conditions. It is anticipated that wetlands and streams with high volumes of water and/or mucky (highly saturated or inundated) soils will be the best candidates. In some cases, a final determination of where to use directional drilling may be made by the electrical contractor, in consultation with the Environmental Monitor, depending on seasonal site-specific conditions. Any such field changes will need to be approved as a modification to the issued wetland permits.

Comment 10Q: Field surveys were conducted from August 20 to 23, and October 2 to 4, 2012, when many plants would not be observed or readily identifiable. Field investigations should be conducted at the appropriate time of year to observe these species. USFWS recommends conducting these surveys prior to completing the SEQRA process in order to accurately identify and evaluate all potential impacts that are likely to result from implementation of the Project.

Response 10Q: Additional field surveys were conducted in the Project area throughout the 2013 growing season, during June, July, August, September, and October. These studies didn't identify any federally- or state-listed plant species. A list of plant species observed on-site is included as FEIS Appendix D.

Comment 10R: Section 3.3.1.2.4 does not provide adequate fish data for the Project area. The DEIS states that no surveys were conducted or existing data obtained from other sources. This section

states that one state-classified trout stream, Boynton Creek, occurs in the Project area; however Section 3.2.1.1 discusses the presence of two NYSDEC-protected streams, Boynton Creek and an unnamed tributary to Boynton Creek. USFWS recommends contacting NYSDEC for data they may have collected or otherwise possess. If no existing data are available, this should be noted in the FEIS. In that case, a rapid bioassessment could be completed to characterize the streams in the Project area.

Response 10R: Boynton Creek is the only mapped trout stream that passes though the Project area. This trout stream will be spanned by overhead wires along the transmission route. This section of Boynton Creek passes through an emergent wetland (Wetland 3T), so there will be no clearing impacts. Furthermore, there will be no poles placed within the stream, and no soil disturbance. The additional trout stream referred to in DEIS Section 3.2.1.1 is an unmapped tributary of Boynton Creek identified during the onsite wetland delineation (Wetland 4J). This small feature drains southwest from an active agricultural field into Boynton Creek. Although the habitat conditions are not likely to support trout, the wetland delineation report assigned a class C(t) to Wetland 4J because it is a tributary of a designated trout stream. There are no Project components in the vicinity of Wetland 4J, which will not be impacted by Project construction or operation. There is no existing, publicly available data about the fish species in the Project area. A rapid bioassessment of the streams in the Project area is not warranted, given the minimal impacts that will occur to such resources. See FEIS Section 2.2.2.2 for discussion of impacts to water resources.

Comment 10S: Section 3.3.1.2.6 of the DEIS erroneously refers to 71 bats tracked during the 2005 study. This should be corrected as 32 (30 females and 2 males) Indiana bats were fitted with radio transmitters and 26 (24 females and 2 males) were subsequently tracked to at least one roost tree.

Response 10S: The commenter is correct, and this error has been corrected in Section 3.0 of the FEIS. The number 71 should have referred to the number of roost trees, not the number of bats. Only 32 bats were fitted with transmitters in the 2005 NYSDEC study; of those, 26 bats were tracked to at least one roost tree. A total of 71 roost trees were used by the Indiana bats during the study. However, the conclusion that Indiana bats from the Glen Park hibernaculum are unlikely to use trees within the Project area for maternal roost colonies remains true. 100% of

the roost trees were in Jefferson County. No tracked bats flew southeast toward the Project area, and none flew to maternal roost sites in Lewis County.

Comment 10T: USFWS agrees that a maternity colony is unlikely to occur within the Project area. However, the DEIS fails to address the potential for periodic activity within the Project area during spring and fall migration, during fall swarming, and by males in the summer. The Project is located within 20 miles of Glen Park, a P2 hibernaculum. Current USFWS draft guidelines (USFWS 2011b) recommend that the area within 20 miles of P2 hibernacula be considered swarming areas. Due to the tendency of male Indiana bats to spend the summer months near hibernacula, swarming habitat is likely to be used as summer habitat as well. Indiana bats are generally expected to be active (outside of hibernacula) within 20 miles of Glen Park between April 1 to October 31. In addition, Indiana bats may fly through the Project area during spring and fall migration to suitable low elevation habitat along the Black River corridor just east of the Project. The DEIS should be revised to address whether the proposed Project is likely to adverse impact Indiana bats.

Response 10T: As indicated in Section 3.3.1.2.6 of the DEIS, the regular occurrence of Indiana bats on the Project site is considered unlikely, and the risk to this species posed by the Project is low. However, because of the proximity to the Glen Park hibernaculum, it is possible that Indiana bats could occasionally occur on (or pass through) the Project area. To address concerns over potential impacts to Indiana bats, the Project Sponsor will implement a range of mitigation measures, such as seasonal tree cutting restrictions, tree planting (or other compensatory mitigation for tree removal), post-construction monitoring, and curtailment of turbines at low wind speeds at night during migratory periods. In addition, Copenhagen Wind Farm, LLC will be applying for a take permit from the USFWS and preparing a Habitat Conservation Plan (HCP) that addresses this issue.

Comment 10U: USFWS recommends discussing the fact that the USFWS is currently evaluating three bat species, northern long-eared bat (*Myotis septentrionalis*), eastern small-footed bat (*Myotis leibii*), and little brown bat (*Myotis lucifugus*), to determine whether they warrant listing under the ESA. USFWS was petitioned to list the northern long-eared and eastern small-footed bat and published a positive 90-day finding for both species in June 29, 2011. Meaning that sufficient information was provided to conduct a more thorough analysis of their status. USFWS anticipates publishing a 12-month finding for these species in the fall of 2013, which

will determine whether either bat warrant protection under the ESA. If so, the USFWS will publish a proposal for their listing and solicit public comments on the proposal. The USFWS is also conducting a status assessment for the little brown bat. Little brown bats and northern long-eared bats were documented during the above-mentioned netting and/or acoustic surveys.

Response 10U: On October 2, 2013, the USFWS announced a 12-month finding in the Federal Register (Volume 78, No. 191, p. 61046), concluding that listing the eastern small-footed bat is not warranted, but that listing the northern long-eared bat is warranted. Accordingly, the USFWS is proposing to list the northern long-eared bat as a federally endangered species throughout its range under the Endangered Species Act of 1973. This announcement initiated a 60-day public comment period, along with the solicitation of peer review from scientific experts. The USFWS will evaluate the comments and information received, and make a final decision on listing the species within 12 months. Federal protection for the little brown bat is also under consideration, but to date, no formal action has been taken by the USFWS. Discussion has been added to the FEIS acknowledging the potential listing of these bat species. Copenhagen Wind Farm, LLC has petitioned the USFWS for take permit coverage for both Indiana and northern long-eared bats and will amend this petition to include additional species if the USFWS warrants their listing.

Comment 10V: USFWS agrees that impacts to the federally-endangered piping plover are not anticipated from construction or operation of the Project.

Response 10V: Comment noted. Piping plover is discussed in Section 3.3.1.2.6 of the DEIS, which concludes, "Suitable breeding habitat for piping plovers does not occur within the Project area. Furthermore, populations of this rare bird in New York State appear to be restricted to Long Island. Therefore, occurrence of this species within the Project area is considered extremely unlikely."

Comment 10W: Table 8 provides a summary of impacts to "vegetation" by location of activity for the Project. USFWS recommends including a table (or several) that breaks "vegetation" into coarse vegetative cover types (e.g., grassland, cropland, deciduous forest). In addition, based upon the proposed Project facilities, the amount of permanent loss of habitat for the construction of wind turbines and workspaces, 12.4 acres, in Table 8 seems too low. Please confirm acreage.

Response 10W: With regard to the permanent loss of habitat for turbines, see DEIS Table 1, which outlines the anticipated areas of construction disturbance for each Project component, providing the typical area of vegetation clearing, area of total soil disturbance (combined temporary and permanent), and area of permanent soil disturbance. As summarized therein, each turbine will permanently disturb 0.2 acres for the life of the Project, consisting of the area to be occupied by the pedestal and crane pad. Accordingly, the 12.4 acres in DEIS Table 8 reflects 62 turbines each permanently impacting 0.2 acres. See FEIS Section 2.2.3.2.1, which updates the Impacts to Vegetation by Project Component Table based on the Project changes (e.g., the reduction in the number of proposed turbines). In addition, a new table has been added to summarize the Impacts to Vegetation by Ecological Community.

Comment 10X: The DEIS indicates that invasive species in regulated wetlands, streams, and other riparian areas will be controlled through the use of an Invasive Species Control Plan. However, there is no mention of controlling invasive plants on upland areas where a similar effort should be completed.

Response 10X: Although the focus of the Invasive Species Control Plan will be the protection of wetlands and streams impacted by Project construction, upland areas dominated by invasive species that should be avoided or subject to control measures will also be identified by the on-site Environmental Monitor. In addition, inspection of construction equipment and deliveries of construction materials for obvious signs of invasive species occurrence will be conducted by the Environmental Monitor throughout the Project area. The updated Invasive Species Control Plan is attached to this FEIS as Appendix E.

Comment 10Y: To avoid impacts to most nesting migratory birds, vegetation removal should not occur between April 1 and July 15. In addition, tree clearing should not occur between April 1 and October 31 to minimize the likelihood of directly impacting tree-roosting bats.

Response 10Y: To minimize potential impacts on tree roosting and nesting wildlife species (including nesting migratory birds, bats species, and other arboreal mammals), the Project Sponsor will schedule tree clearing during the hibernation period for Indiana bat (i.e., November 1 to March 31). This will also minimize impacts to nesting migratory birds.

Comment 10Z: The DEIS mentions the possibility of silt and sediment deposition within aquatic habitat due to earth-moving activities, but does not mention which areas that might encompass. A more thorough evaluation of this issue should be provided.

Response 10Z: See Section 3.3.2.1.2 of the DEIS, which indicates that siltation and sedimentation could occur down slope of areas subject to significant earth-moving activity (e.g., turbine sites). See also DEIS Section 3.3.3.2, which describes mitigation measures to avoid and minimize impacts to aquatic resources resulting from construction-related siltation and sedimentation, including an approved sediment and erosion control plan, a SWPPP, and a SPCC. These measures are also described in greater detail in Section 3.2.3 of the DEIS.

Comment 10AA: Forest habitat is important for a number of wildlife species and also because it is less common in the immediate Project area. Therefore, all efforts should be made to limit the amount of forest disturbance. Further, larger patches of forest and those that provide corridors that connect patches should be maintained. USFWS recommends that the Project Sponsor reevaluate the Project design and move Project infrastructure out of forest areas as much as possible. Project facilities within forests can result in reduced habitat quality, smaller forest patch size, and changes in vegetation structure. Fragmentation can also lead to increased predation, lower productivity, and the spread of invasive species. Mitigation for forest removal, such as tree planting, should be provided to replace lost habitat functions and values.

Response 10AA: As described in FEIS Section 2.1, a number of changes have been made to the Project layout since release of the DEIS, in part to reduce impacts to forested areas. A total of 15 turbines have been eliminated from the DEIS layout. Of these, 11 had been located in forested areas (Turbines 7, 16, 22, 28, 29, 58, 59, 60, 61, 62, and 63). Thirteen turbines currently remain in forested areas, often due to landowner preferences for avoiding impact to active agricultural land. However, to minimize forest fragmentation impacts, nine of the 13 turbines in forested areas are near the edge of the forest (i.e., within 150 feet of the edge). The remaining four turbines (2, 3, 10, and 51) are located 312 feet, 420 feet, 155 feet, and 207 feet from the edge, respectively. As result of the Project changes, the anticipated temporary and permanent impacts to forested communities are significantly lower than had been predicted in the DEIS (see FEIS Table 2), and substantial fragmentation impacts are not anticipated. As indicated in FEIS Section 2.2.3.3, the Project Sponsor is planning to mitigate for tree clearing impacts by

planting trees or other similar measures. Specific details of this compensatory mitigation will be developed in consultation with the USFWS and NYSDEC.

Comment 10BB: The DEIS states, "None of the construction-related impacts described above will be significant enough to affect local populations of any resident or migratory wildlife species." Data should be provided to substantiate this statement or it should be removed.

Response 10BB: It is acknowledged that the statement as written in the DEIS is unsubstantiated, as the impacts cannot be predicted with absolute certainty. However, the intent was simply to indicate that the temporary nature of construction-related impacts is such that it is unlikely that construction-related impacts will have a significant impact on local populations of resident or migratory wildlife species. The sentence has been revised for inclusion in the FEIS to indicate that "construction-related impacts resulting from the proposed Project are not anticipated to be substantive enough or of a sufficient duration to significantly affect local populations of any resident or migratory wildlife species."

Comment 10CC: Tree removal should not occur between April 1 and October 31 to minimize the likelihood of directly impacting Indiana bats. Impacts to bat species that are being considered for federal listing should be addressed in this section or in Section 3.3.2.1.2.

Response 10CC: As indicated in Section 3.3.1.2.6 of the DEIS, use of the Project area for roosting by Indiana bats is considered unlikely. However, to minimize potential impacts on tree roosting and nesting wildlife species (including Indiana bats, birds, other bat species, and arboreal mammals), the Applicant will schedule tree clearing during the hibernation period for Indiana bat (i.e., November 1 to March 31). Additionally, in order to address potential impacts to Indiana bats, as well as the northern long-eared bat and little brown bat, both under review for federal listing, Copenhagen Wind Farm, LLC will be applying for a take permit from the USFWS and preparing a Habitat Conservation Plan (HCP). The HCP will describe the anticipated effects of the possible taking, along with strategies to minimize, monitor, and mitigate such impacts, and the available funding to implement the monitoring and mitigation measures. The Project Sponsor is committed to implementing the range of mitigation measures discussed in Section 2.2.3.3 of the FEIS.

Comment 10DD: The first paragraph in Section 3.3.2.2.1 discusses construction impacts to vegetation and not operating impacts. Therefore, this paragraph should be moved to Section 3.3.2.1.1.

Response 10DD: It is true that the impacts discussed in DEIS Section 3.3.2.2.1 will initially occur during Project construction, but please note that this paragraph primarily discusses permanent impacts (i.e., those that will remain throughout the operational life of the Project). The discussion in DEIS Section 3.3.2.1.1 includes both permanent and total impacts, focusing largely on those temporary impacts that will be subject to restoration following construction.

Comment 10EE: A reference is made to a NYSERDA report that compares potential impacts of various forms of energy development to wildlife (NYSERDA 2009). USFWS notes that this is a generic report and does not contain site-specific information. Therefore, it is inappropriate to compare this Project to other forms of energy development in specific terms.

Response 10EE: The discussion of the 2009 NYSERDA report in DEIS Section 3.3.2.2.2 does not compare the Project to other forms of energy development in specific terms. Instead, the report is summarized in general terms, as indicated by the sentence that introduces the study:

> *"With respect to impacts to wildlife in general, a recent NYSERDA report compares the risk to wildlife from six different electricity generation types: coal, oil, natural gas, hydro, nuclear, and wind (Newman et al., 2009). For each generation method, a relative level of risk (lowest, lower, moderate, higher, and highest) was assigned for each of six different phases (resource extraction, fuel transportation, facility construction, generation, transmission and delivery, and decommissioning). While each of these generation methods pose risks to wildlife individuals and/or populations, the degree and extent of the risks depend on the energy generation source. The report concluded that non-renewable electricity generation sources, such as coal and oil, typically pose higher risks to wildlife than renewable sources, such as hydro and wind. "Coal as an electricity generation source is by far the largest contributor to risks to wildlife found in the NY/NE region." Overall, the greatest risks to wildlife occur during the resource extraction and generation phases of power production. Since wind powered electricity production does not entail a resource extraction phase, threats from fuel extraction and transportation do not apply. For the other four phases, relative risk levels for wind ranged from "lowest" to "moderate."*

In contrast, each of the other five electricity generation types had at least one phase with a risk level of "higher" or "highest" (Newman et al., 2009)."

This discussion serves as an introduction to the discussion of impacts to fish and wildlife, and is valuable for context. Note that it is followed by a separate analysis of site-specific impacts, which clearly acknowledges the impacts that are likely to occur from development of the proposed Project: "wind power projects are not without impacts to wildlife, and operational impacts of the Copenhagen Wind Farm are expected to include loss of habitat, possible forest fragmentation, wildlife displacement due to the presence of the wind turbines, and avian and bat mortality as a result of collisions with operating turbines." Each of these site-specific impacts is subsequently described in greater detail in Section 3.3.2.2.2 of the DEIS. See also FEIS Section 2.2.3.2, which updates the discussion of site-specific impacts.

Comment 10FF: Section 3.3.2.2.2 of the DEIS discusses the potential impacts of forest fragmentation on forest-interior birds. The section should note how many patches of forest habitat will be fragmented by Project roads, utilities, and wind turbine pads. Also, the initial and proposed sizes of these areas should be discussed to inform the reader on the degree of forest fragmentation attributable to the Project.

Response 10FF: Additional analysis of forest fragmentation impacts has been added to the FEIS (see Section 2.2.3.2.1). See also response to Comment 10AA.

Comment 10GG: The DEIS addresses bird collision risk with turbines rotors, guy wires, and turbine towers. However, the assessment of avian impacts relies on outdated information (e.g., 2003 estimates of bird collisions) and should be updated with the most recent fatalities estimates. The FEIS should include a discussion of the data collected at the adjacent Maple Ridge project, which is relevant to the potential impacts of the Project. It can also help inform the assessment of cumulative impacts from multiple projects. The number of birds killed per turbine at Maple Ridge ranged from 3.13 to 9.59 during studies conducted in 2006-2008 (Jain et al. 2007, 2009a, and 2009b). If similar levels of mortality are observed at the Project, then the cumulative impacts to some species may be high.

Response 10GG: The mortality rates observed at the Maple Ridge facility are discussed in Section 3.3.2.2.2 of the DEIS, and are included in DEIS Table 9, along with recent data collected at other

operating New York State wind energy facilities between 2006 and 2011. The commenter is correct that, based on the adjacent Maple Ridge Wind Farm mortality survey results, annual mortality rates at the Copenhagen Wind Farm could be in the range of 3.13 to 9.59 birds per turbine. However, it should be noted that Maple Ridge mortality affected a variety of species, primarily migrant passerines (Jain et al., 2007, 2009a, 2009b). In other words, mortality was dispersed among many different species, not restricted to a single or few species, which could result in greater cumulative impacts to such species. For example, in 2006, post-construction mortality searches identified 125 avian fatalities representing 30 species; of those, 104 were songbird fatalities, involving 26 species (Jain et al., 2007). In 2007, post-construction mortality searches identified 64 avian fatalities representing 21 species (Jain et al., 2009a), while in 2008, post-construction mortality searches identified 74 avian fatalities representing 32 species (Jain et al., 2009b). Similar results have been documented in other large scale mortality studies at operating wind projects (e.g., Taucher et al., 2012).

Furthermore, virtually all birds killed by the Maple Ridge turbines have been relatively common species whose populations are not likely to be impacted by wind turbine impacts (Jain et al., 2007, 2009a, 2009b). Golden-crowned kinglet fatalities were observed more often than other species during searches in 2006, 2007 and 2008. According to the Maple Ridge post-construction mortality studies, the eastern population of golden-crowned kinglet is estimated to be decreasing across the U.S., but stable or increasing in the eastern U.S. Given the overall population of this species (estimated 34 million birds), it is unlikely that the level of collision mortality observed at Maple Ridge could have a significant adverse effect on population levels, even with respect to cumulative impacts of fatalities from many wind plants (Jain et al., 2009a, 2009b). A compilation of avian mortality data in 2005 predicted that an estimated 500 million to possibly over 1 billion birds are killed annually from anthropogenic causes. Buildings (~550 million) and power lines (~130 million) are known to cause the greatest mortality (Erickson et al., 2005). An estimated 28.5 thousand avian mortalities per year are predicted for wind turbines. Consequently, it is unlikely that any one species will be significantly impacted by wind power developments, either individually or cumulatively.

Comment 10HH: The DEIS states that there is a lack of open water habitat in the Project area and waterbirds typically migrate at high altitudes; therefore, the collision risk to waterbirds is low. However, the Project area does contain a fairly large number of wetland areas that could attract a

number of species, including mallard, great blue heron, and Canada goose. The Project Sponsor should re-evaluate the risk potential with this information taken into consideration.

Response 10HH: Review of wetland maps for the Generating Site indicates the presence of nine state-regulated wetlands over 12.4 acres in size (C-9, C-12, C-13, C-14, C-15, C-19, C-20, C-21, and C-22). According to NWI mapping, the majority of these are forested or scrub-shrub wetlands. Large bodies of open water or emergent marshes that would attract waterbirds are limited to Pleasant Lake, located approximately 1 mile north of the nearest turbine. With the exception of a few small farm ponds, the on-site wetland delineation conducted during the summer of 2013 confirmed that such open waterbodies/wetlands are lacking within the Generating Site. See FEIS Appendix B.

Comment 10II: Section 3.3.2.2.2 of the DEIS should address the risk of avian mortality due to collisions with power lines and poles. Avian electrocution can occur if structures are not properly designed. Refer to the Avian Protection Plan Guidelines (Avian Power Line Interaction Committee and USFWS 2005) for more information on developing an avian protection plan for the Project's transmission lines. Section 4.1 includes the following minimization measure: "Minimizing overhead transmission lines and designing any overhead transmission line in accordance with Avian Power Line Interaction Committee (APLIC) guidelines to minimize impacts on birds." The FEIS should include further discussion of this.

Response 10II: Additional discussion of APLIC guidelines has been added to Section 2.2.3.3 of the FEIS, including specific discussion of APLIC Recommendations for Power Pole Configurations at Wind Energy Projects.

Comment 10JJ: Bat fatalities are discussed in Section 3.3.2.2.2 of the DEIS in terms of state, regional, and national mortality rates. It is estimated that the Project fatality rate will fall with the range of other New York wind projects. USFWS believes it is more appropriate to state that the bat mortality is likely to resemble the mortality rates at the adjacent Maple Ridge Wind Farm (as it is in close proximity to the Project), which is among the highest in the state. The FEIS should estimate the number of bat fatalities according to Table 10 in the DEIS. Therefore, an average bat fatality rate of 17 bats per turbine would result in the annual death of 833 bats or 24,990 bats over the 30-year life of the Project. This information should be factored into the cumulative impact assessment.

Response 10JJ: Section 3.3.2.2.2 of the DEIS did estimate the number of bat fatalities expected from the Project based on the data in Table 10,

> *"It is anticipated that the bat fatality rates for the Project will be within the wide range of bat fatality rates documented in the New York studies summarized in Table 10. A lower bound estimate of 44 bat fatalities per year is based on the results of the 2008 survey results from the Munnsville Wind Project in Madison and Oneida Counties, New York (Stantec, 2008). An upper bound of 1,521 bat fatalities per year is based on the results of 2006 surveys conducted at the Maple Ridge Wind Project (Jain et al., 2007). An average fatality rate of 406 bats per year at the Copenhagen Wind Farm was also calculated based on the weekly bat/MW/study period rates provided in Table 10."*

This information has been updated in FEIS Section 2.2.3.2.2 to reflect the changes in Project layout (i.e., the reduction in the number of turbines proposed). Language has also been added indicating that mortality rates at the Project may most closely resemble those observed at Maple Ridge, and an average annual mortality rate based on the Maple Ridge numbers has been included. An updated cumulative impacts assessment for combined mortality impacts from the proposed Project and other area wind energy facilities is also included in FEIS Section 2.2.3.2.2. However, it should be noted that due to the effect of white-nose syndrome, the population of myotid bats has been substantially reduced in New York State since the Maple Ridge data were collected. Consequently, the actual per-turbine mortality numbers for the Copenhagen Wind Farm are likely to be lower than those seen at Maple Ridge.

Comment 10KK: The DEIS has found that the potential for impacts to bald eagle is low. However, data was only collected during spring and fall raptor migration surveys and no data are provided to illustrate bald eagle use during the summer or winter months. According to the USFWS eagle fatality assessment model, the Project fatality rate will fall below 1 eagle over the lifetime of the Project and, therefore, a permit for take of bald eagles is not necessary at this time. This calculation is based on risk during the migration period only and increased use during the summer or winter months may result in a higher fatality estimate. USFWS recommends that the Project Sponsor include additional information to identify the closest bald eagle nests to the project location and the presence or absence of over-wintering bald eagles in this area. If bald eagle populations in the local Project area (10 miles from the Project boundary) increase over the lifetime of the Project, or a bald eagle nest is established within 4 miles of the project,

USFWS recommends that the Project Sponsor contact USFWS to reassess the risk associated with the Project.

Response 10KK: Based on the most recent *New York State Bald Eagle Report,* it appears that the closest documented bald eagle nests are located at the Perch River Wildlife Management Area, approximately 16-19 miles northwest of the nearest turbine. Bald eagles also nest at the Salmon River Reservoir, approximately 25 miles southwest of the nearest turbine (Nye, 2010). Other large bodies of open water in the region that could attract eagles during the summer and winter seasons include the Black River, Lake Ontario, and the St. Lawrence River. Of these, the Black River is closest to the proposed Project, located approximately 2.7 miles northeast of the nearest turbine. Correspondence from the NYSDEC (dated January 30, 2013) did not identify any bald eagles in the vicinity of the Project area, and the associated New York Natural Heritage Program (NYNHP) database searches are typically performed within 10 miles of wind energy facilities. However, as discussed in Section 3.3.1.2.1 of the DEIS, bald eagles have been observed wintering in the region during the Audubon Christmas Bird Count (National Audubon Society, 2013). If in the future active bald eagle nests are established within 10 miles of the Project, Copenhagen Wind Farm, LLC will contact the U.S. Fish and Wildlife Service (USFWS) to evaluate the risk posed by their presence and discuss future management of the Project that might reduce risk to bald eagles.

Comment 10LL: The DEIS does not provide sufficient information on potential impacts to upland sandpiper or other State-listed grassland birds species that breed in the Project area. The DEIS only states that current active agriculture would result in greater impacts, however it is not clear how many turbines are proposed in active agriculture areas. Also, it is not clear if proposed turbine locations would cause displacement of these open-area species.

Response 10LL: According to correspondence with the NYNHP, upland sandpiper is the only State-listed grassland bird known to nest within the Project area. The DEIS provided a more thorough assessment of potential impacts to upland sandpiper than indicated in this comment (see Section 3.3.2.2.3):

> *"Although upland sandpipers were not observed during any of Sanders field surveys, correspondence from the NYNHP indicates that this species breeds on-site, and data from the BBS and BBA also indicate that it breeds in the area. Very little data is available specific to the impacts of wind turbines on upland sandpiper. With regard to*

displacement, a post-construction study in Ontario found little change in breeding density between 0-200 meters from the turbine base, but a decrease at 200-300 meters (Stantec, 2011b). Courtship display flights can be within rotor swept zones (Illinois DNR, 2007), suggesting potentially elevated collision risk. However, in a post-construction mortality study in northeastern Wisconsin where upland sandpiper was "widespread and fairly common", and often observed "very close to the wind turbines", no fatalities to the species were recorded (Howe et al., 2002), suggesting possible turbine avoidance behavior. The Ontario study likewise recorded no upland sandpiper fatalities (Stantec, 2011b). The risk of upland sandpiper collision, disturbance, displacement, or habitat loss as a result of operation of the Project is considered low-to-moderate based on the species' frequency of occurrence in the area."

In addition, Section 3.3.2.2.2 of the DEIS evaluates potential disturbance and displacement impacts of Project operation to breeding birds, with a specific discussion of grassland birds. As indicated, several studies have documented that wind turbines have a potential displacement impact on some species of grassland birds (Johnson et. al., 2000; Leddy et. al., 1999; Kerlinger & Guarnaccia, 2010).

Based on the revised Project layout, 26 turbines are proposed to be sited in active agricultural land, 24 in cropland and two in pastureland (see also response to Comment MM). As such, these fields are subject to periodic disturbance from tilling, mowing, and harvesting, and do not represent ideal habitat for upland sandpiper. Three additional turbines are located in successional old field communities. According to the NYNHP (2013) abandoned fields with invading shrubs and trees often exclude upland sandpipers, which tend to prefer grassy areas with 10-15% forb cover and less than 1% shrub cover. Based on those criteria, no turbines are sited in areas of ideal habitat for upland sandpiper.

Comment 10MM: USFWS recommends more details be provided in Section 3.3.2.2.3, such as number of turbines proposed in active agriculture areas including the number of cropland turbines versus turbines proposed in pasture, fallow, and successional fields and a comparison of these areas where rare grassland birds species have been documented. Turbines proposed in areas where rare species are breeding should be moved to areas where impacts would not occur.

Response 10MM: As described in FEIS Section 2.1, a number of changes have been made to the Project layout since release of the DEIS, in part to reduce impacts to wildlife and wildlife habitat. The table below summarizes the habitats in which turbines are sited for both the DEIS and FEIS layouts.

Habitat	# of Turbines DEIS Layout	# of Turbines FEIS Layout
Cropland	28	26
Pasture	2	2
Forestland	27	13[1]
Successional Old Field	2	3
Successional Shrubland	3	3
Total	62	47

[1] To minimize forest fragmentation impacts, 9 of the 13 turbines in forested areas are within, but near the edge of the forest (i.e., within 150 feet of the edge). The remaining three turbines (2, 3, 10, and 51) are located 312 feet, 420 feet, 155 feet, and 207 feet from the edge, respectively.

Comment 10NN: The DEIS fails to address the potential for periodic Indiana bat activity within the Project area during spring and fall migration, during fall swarming, and by males in the summer.

Response 10NN: See Response to Comment 10T.

Comment 10OO: Section 3.3.2.2.3 of the DEIS should have included a discussion of the five documented Indiana bat fatalities from four wind projects and the likely under-representation of actual fatalities that have occurred to date. At this point, USFWS disagrees with the statement that the risk to the Indiana bat is considered low. USFWS anticipates take of Indiana bats from the operation (and potentially the construction) of the proposed project. However, USFWS does not understand Project details sufficiently to discuss the extent of adverse effects. USFWS expects to explore measures to avoid, minimize, and compensate for impacts to Indiana bats with the Project Sponsor.

Response 10OO: The discussion of anticipated bat mortality has been revised for the FEIS, based on the changes in Project layout (i.e., the reduction in the number of turbines proposed). See Section 2.2.3.2.2 of the FEIS, which has also been supplemented with new information about the recorded instances of Indiana bat fatalities at wind energy facilities. The basis for the DEIS statement with respect to risk to Indiana bat is as follows: the potential for Indiana bat presence within the Project area is considered low, because of the location of the site in relation to documented hibernaculum. The Glen Park hibernaculum is located in Jefferson

County, approximately 13 miles northwest of the generating site. Bats emerging from hibernation generally fly north, northwest, west, southwest, and south to maternal roost sites; 100% of the bats tracked in a 2005 NYSDEC study moved to summer roost sites in Jefferson County, both females and males. No tracked bats flew southeast toward the Project area, and none flew to maternal roost sites in Lewis County (NYSDEC, unpublished data). This data suggests that Indiana bats from the Glen Park hibernaculum are unlikely to routinely use trees within the Project area. See also Response to Comment 10T, which discusses the Applicant's plans for a HCP. It is anticipated that various mitigation measures, including use of a cut-in speed that reduces bat mortality, will be considered as part of the HCP for Indiana bats that will be developed in consultation with the USFWS.

Comment 10PP: Impacts to the northern long-eared bat and little brown bat should also be addressed in this section or in Section 3.3.2.2.2.

Response 10PP: With the proposed/potential listing of northern long-eared bat and little brown bat, discussion of potential impacts to these species has been added to Section 2.2.3.2.2 of the FEIS. See also Responses to Comments 10T and 10U.

Comment 10QQ: Section 3.3.3.2 of the DEIS should include discussion of a time-of-year restriction for vegetation removal to address potential impacts to bats and birds during the breeding season.

Response 10QQ: See Response to Comment 10CC.

Comment 10RR: Section 3.3.3.2 of the DEIS states that implementation of the Project can be considered mitigation for the impacts caused by coal, oil, etc. USFWS disagrees with this statement. The DEIS should address mitigation for the impacts to fish and wildlife caused by the Project, including the expected lethal impacts to migratory birds and bats.

Response 10RR: Comment noted. See FEIS Section 2.2.3.3, which includes discussion of several mitigation measures now proposed for implementation at the Project. In addition, the Project Sponsor is now committing to engage with USFWS through an HCP to further define the various mitigation options for potential impacts to federally-endangered bats. See also Responses to Comments 10EE and 11CC.

Comment 10SS: Section 3.3.3.2 of the DEIS states that the Project could potentially kill a large number of bats per year based on estimates from other projects. Since bats have a low reproductive output and usually produce only one to two pups per year, this level of mortality could have substantial effects on local or regional populations when taken into consideration with other mortality factors. However, no mitigation measures are provided in the DEIS to offset potential impacts to bats. Therefore, USFWS disagrees with the statement that the Project has been adequately designed to minimize bat collision mortality. USFWS believes that adverse impacts to Indiana bats and other bat species are likely from the Project, but these can be avoided through operational measures. USFWS recommends that the Lead Agency require the Project Sponsor to use a cut-in speed that reduces bat mortality as a mitigation measure.

Response 10SS: The Project Sponsor is committed to implementing a range of measures to mitigate for potential impacts to bats. As described in FEIS Section 2.2.3.3, mitigation measures could include any or all of the following strategies:

- seasonal tree cutting restrictions,
- tree planting or other compensatory mitigation for tree removal,
- post-construction monitoring,
- curtailment of turbines at low wind speeds at night during migratory periods, and
- adaptive management.

Specific details of these strategies (e.g., study methods and duration) will be developed in consultation with the USFWS and NYSDEC. See also Responses to Comments 10T and 10U. In addition, Copenhagen Wind Farm, LLC will be applying for a take permit from the USFWS and preparing a Habitat Conservation Plan (HCP) that addresses this issue.

Comment 10TT: USFWS recommends including a strong adaptive management component to implement various mitigation strategies. The program should be developed prior to completion of the FEIS. USFWS notes that post-construction mortality monitoring is not a minimization measure. However, incorporation of results into a robust adaptive management plan that includes various measures is appropriate.

Response 10TT: See Response to Comment 10SS. The Project Sponsor is committed to implementing a range of mitigation strategies that could include adaptive management.

Comment 10UU: USFWS recommends expanding discussion to include proposed and operating projects in Jefferson County, New York and Ontario, Canada, such as the proposed Cape Vincent Wind Energy Project (124 turbines) and the operating Wolfe Island Wind Energy Project (86 turbines).

Response 10UU: The NYISO queue includes a number of proposed wind energy projects in Jefferson County: Hounsfield Wind Farm, St. Lawrence Wind Farm, Cape Vincent Wind Farm, and Horse Creek Wind Farm. Each of these proposed projects is discussed briefly below, along with the operational Wolfe Island Wind Farm in Ontario:

- *Hounsfield Wind Farm* – This proposed project consists of 82 turbines proposed to be located on Galloo Island, approximately 33 miles west of the nearest Project turbine. However, the state Public Service Commission dismissed the transmission line application in June 2013, due to a lack of any activity on the project since 2011. The developer filed no response to the motion to dismiss, and no interlocutory appeal (Lee, 2013). Without a power purchase agreement or a means to interconnect the project to the regional transmission grid, Hounsfield is unlikely to be constructed, and therefore, is not included in the cumulative impacts analysis.
- *Cape Vincent Wind Farm/St. Lawrence Wind Farm* – Although St. Lawrence Wind Farm and Cape Vincent Wind Farm are still listed separately in the NYISO queue, these projects have merged. The Cape Vincent developer, BP Wind Energy, acquired the assets of the St. Lawrence Wind Farm in February 2012, and is currently developing a project that combines the two smaller projects. The Cape Vincent Wind Farm, located approximately 29 miles northwest of the nearest Project turbine, now includes 124 proposed turbines being permitted through the Article 10 process.
- *Horse Creek Wind Farm* – This proposed project is located approximately 20 miles northwest of the nearest Project turbine, and includes 48 proposed turbines. A DEIS was released for this project in 2011, but no approvals or permits have been issued to date.
- *Wolfe Island Wind Facility* – Located at the mouth of the St. Lawrence River approximately 37 miles northwest of nearest turbine, this project includes 86 turbines that commended operation in 2009.

All of these projects are far enough away from the proposed Copenhagen Wind Farm that their contribution to cumulative impacts, as this term is used in the context of SEQR, is questionable. As indicated in the DEIS (see Section 3.3.2.2.2), bird and bat collision mortality rates documented at wind power projects are highly variable, and essentially impossible to predict with any accuracy prior to construction. Consequently, the standard approach is to look at the range of mortality documented at operating wind projects elsewhere (i.e., the number of birds or bats killed per turbine or per MW) and apply those mortality rates to the project in question, based on the number of turbines or nameplate generating capacity proposed. The same approach is used when calculating potential cumulative impacts. The combined number of turbines or generating capacity of the multiple projects is multiplied by the range of documented mortality at operational projects.

To evaluate potential cumulative bird and bat collision mortality impacts, the DEIS (see Section 8.0) and FEIS (see Section 2.2.18) looked at the potential combined size of the Maple Ridge, Roaring Brook and Copenhagen Projects and multiplied that total[6] by the range of mortality rates observed at operating projects in New York State. The resulting range of possible mortality is extremely large/wide. In fact, the range is so large as to be essentially meaningless (i.e., no conclusion can be reached regarding the number of birds and bats potentially killed). Adding additional projects to this cumulative impact analysis can be done by simply multiplying the number of turbines (or MW) from however many additional projects one wishes to consider by the range of mortality rates reported in the DEIS. This exercise will indicate the obvious fact that more projects equates to more potential collision mortality, but beyond that, adds nothing to our understanding of the actual magnitude or significance of this impact.

Comment Letter 11. Rudyard G. Edick, New York State Department of Environmental Conservation

Comment 11A: A NYSDEC permit will be required for any navigable water that will be disturbed as a result of the Project. Stream crossings should be designed with the goal of protecting stream continuity. Regarding wetlands, the FEIS should discuss how the proposed Project will avoid streams and minimize impact where disturbance is required. The steps taken to avoid and minimize impacts should be clearly addressed in the FEIS.

[6] The Maple Ridge, Roaring Brook, and Copenhagen Projects combine for a total of 281 turbines, with a combined nameplate capacity of 479 MW.

Response 11A: Since the release of the DEIS, a field delineation of all wetlands in the vicinity of Project components has been performed (see Appendix B). Results of the wetland delineation are summarized in Section 2.2.2.1 of the FEIS. Modification to the Project layout has significantly reduced permanent impacts to streams and wetlands. Based on the wetland delineation and current Project layout, a total of 0.15 acre of permanent wetland impact and 10.95 acres of temporary wetland impact are anticipated. See Section 2.2.2.2 of the FEIS for more information about anticipated impacts to wetlands and streams, including an assessment of impacts to NYS Freshwater Wetlands and regulated adjacent areas. In addition, a Storm Water Pollution Prevention Plan (SWPPP) and a Spill Prevention, Control and Countermeasures Plan (SPCC), will be adhered to during and following construction to avoid and minimize potential impacts to water bodies and wetlands. To mitigate potential impacts to streams and wetlands during construction, boring, coffer dam and pump around, and other best management practices will be utilized.

Comment 11B: NYSDEC is awaiting electronic data files from OWN Energy depicting the total Project layout in relation to known locations and associated habitats of disturbance. The layout currently provided is not in sufficient resolution to permit the examination.

Response 11B: In August 2013, when the comment letter from NYSDEC requesting the electronic data files was received, the Project Sponsor was actively engaged in re-designing the Project layout to reduce environmental impacts. Therefore, to avoid wasting NYSDEC's time analyzing a layout that was no longer proposed, electronic files were not provided at that time. Once the layout was finalized, the Project Sponsor reached out to NYSDEC, and electronic data files were provided to the Commenter in December 2013.

Comment 11C: On Page 3 of the Executive Summary states, "Proximity to the Cortland County landfill" is listed as a potential impact, which is a typo.

Response 11C: Comment noted. See FEIS Section 3.0, which includes acknowledgement of and correction of this error.

Comment 11D: Page 4 of the Executive Summary states that 14 acres of wetland could be disturbed by Project construction. Clarify if that is NYSFWW, USACE, or both.

Response 11D: As described in FEIS Section 2.1, the Project layout has changed somewhat since the release of the DEIS, resulting in significantly reduced impacts to wetlands. The currently anticipated impacts to state and federal jurisdictional wetlands are fully described in Section 2.2.2.2 of this FEIS.

Comment 11E: Page 4 of the Executive Summary states that 0.5 acre of wetland will be permanently impacted. NYSDEC recommends shifting the building to avoid impacts to regulated wetlands.

Response 11E: As described above in Response to Comment 11D, the Project layout has changed somewhat since the release of the DEIS, resulting in significantly reduced impacts to wetlands. Permanent wetland impacts have been reduced from 0.5 acre to 0.15 acre. Project layout changes are described in FEIS Section 2.1 and illustrated in FEIS Figure 1. Permanent impacts to wetlands based on the current layout total just 0.15 acre (see Section 2.2.2.2).

Comment 11F: Page 5 of the Executive Summary states that "best practice" construction techniques that minimize disturbance to vegetation, streams, and wetlands will be utilized. Are "best practices" meant to be Best Management Practices (BMP)? NYSDEC would like to see a list of BMPs that would be employed so as to avoid and minimize disturbance to vegetation, streams, and wetlands.

Response 11F: The term “best practices”, as used in the Executive Summary of the DEIS, is essentially equivalent to “Best Management Practices. The DEIS describes measures to be utilized to minimize and mitigate for temporary and permanent impacts to wetlands. Best Management Practices (BMPs) are specifically described immediately after the following introduction: “Where crossings of surface waters and wetlands are required, the Project Sponsor will employ Best Management Practices associated with particular, applicable streamside and wetland activities, as recommended by the NYSDEC and the USACE, and required by the issued wetland/waters permits.” See Section 3.2.3 of the DEIS. See also Response to Comment 9C.

Comment 11G: The brief Alternatives discussion on page 6 of the Executive Summary is not adequate. Where are the alternatives located? What were the impacts (both temporary and permanent) of the alternatives?

Response 11G: The Alternatives discussion on page 6 of the Executive Summary is just a summary. The full Alternatives analysis is presented in Section 5.0 of the DEIS, which includes evaluation of alternative Project area/sites, alternative Project design/layout, alternative Project size, alternative technologies, alternative construction phasing, a no action alternative, and alternatives that avoid significant impacts. See also Section 2.2.15 of the FEIS.

Comment 11H: Page 20 states that the O&M facility, temporary turbine construction staging area, substation, meteorological tower, and turbine foundations will not be located within State-regulated freshwater wetlands, and placement of electrical collection lines, transmission lines, and access roads in wetlands/streams will be avoided to the extent possible. The O&M facility, temporary turbine construction staging area, substation, meteorological tower, and turbine foundations should also be outside the regulated adjacent area of state-regulated areas. The adjacent area is a 100-foot buffer around New York State mapped wetlands. The adjacent area needs to be emphasized as an area to avoid as well.

Response 11H: The regulated adjacent area of state-regulated wetlands was recognized as a sensitive resource and has been avoided to the extent possible. However, because avoidance of delineated wetlands and streams was a priority during Project siting, upland areas located within regulated 100-foot adjacent areas of NYSDEC freshwater wetlands were preferred over wetland/stream impacts. Disturbances to the 100-foot regulated adjacent areas to NYSDEC freshwater wetlands are described in Section 2.2.2.2 of the FEIS.

Comment 11I: During Project construction, clearing is not to interfere with wetlands or their adjacent areas. Shift the laydown areas into the fields and out of the wetlands and adjacent areas. Chipped material could be used by the new cogeneration plant located on Fort Drum. They need approximately 70 to 80 truckloads per day to operate their facility.

Response 11I: Revisions to the proposed Project layout have been made in an attempt to minimize impacts to state and federal jurisdictional wetlands, and to the regulated adjacent area of state wetlands. This has been accomplished by relocating Project components away from delineated wetlands, and shifting these components to field edges and other areas that do not require tree clearing. As indicated in Section 2.2.2.2 of the FEIS, temporary impacts to wetlands total 11.1 acres, but permanent impacts are limited to just 0.15 acres. Approximately 6.42 acres of forested wetlands and 1.22 acres of forested adjacent area will be impacted by Project

construction. Of the 6.42 acres of impact to forested wetlands, 0.41 acres will be allowed to regenerate following construction, and the remaining 6.01 acres will be converted to another cover type (i.e., be maintained as an open community for the life of the Project). There will be no permanent fill placed within forested wetlands or forested 100-foot NYSDEC-regulated upland adjacent areas. The 1.22 acres of forested adjacent upland area will be maintained as an open community for the life of the Project.

Disposal of woody vegetation cleared during Project construction is anticipated to involve piling of logs (for use by the landowner) and chipping of limbs and brush. Chipped material would typically be spread on site. Removal and off-site disposal of chipped material (including perhaps at a biomass facility) is possible. However, because the material being cleared belongs to the individual landowners, any such disposal would have to be approved, or undertaken, by the affected landowners.

Comment 11J: According to the DEIS direct burial methods will be used during the installation of underground electrical collector system whenever possible. NYSDEC warns to be mindful of "piping" for flows eroding the pipes and altering natural flows. Piping occurs when normal path of groundwater is intercepted because the soil and sediment compactness has been altered, modifying the hydraulic conductivity of the soil and sediment layers, allowing water to flow in the path of least resistance along the cable, line, or pipe that has been buried.

Response 11J: The potential for “piping” or migration of groundwater along buried lines is acknowledged in Section 3.2.2.1.2 of the DEIS as a possible concern. To minimize the chances of this happening, disturbed soils/backfill over all buried lines will be adequately compacted. Direct buried (e.g., via a cable plow) typically involves less soil disturbance than open trenching. It also does not involve the use of granular backfill, thus providing less opportunity for piping than conventional trenching methods. Where shallow groundwater or other on-site conditions increase the likelihood of piping, the installation of buried tile lines or impervious slope breakers may be used to control and/or re-direct the flow of groundwater within the excavated trench.

Comment 11K: All spills must be reported to the NYS Spill Hotline: 1-800-457-7362.

Response 11K: Section 3.2.3 of the DEIS indicates that "Any spills will be reported in accordance with state and/or federal regulations." This includes contacting the NYS Spill Hotline.

Comment 11L: Turbine 1 appears to be located within NYS Freshwater Wetland CT-20. NYSDEC suggest the turbine be removed or moved toward the east into the nearby field.

Response 11L: Through wetland delineation efforts and ground reconnaissance of surrounding upland areas, the current Project layout has been revised to avoid placement of turbines and associated infrastructure in wetlands, wetland adjacent areas, and streams wherever possible. Turbine 1 was moved into the nearby field, and currently has no impact on NYS Freshwater Wetland CT-20.

Comment 11M: The connection line between Turbine 52 and 19 traverses through NYS Freshwater Wetland CT-20. NYSDEC recommends directional drilling under the wetland or cross at the narrowest location.

Response 11M: As described in FEIS Section 2.1, the Project layout has been refined since the release of the DEIS, resulting in significantly reduced impacts to wetlands. Turbines 18, 19, and 20 have been eliminated from the current Project layout, along with the collection line that had connected to Turbine 52. As a result of these changes, there will be no direct impacts to NYS Freshwater Wetland CT-20.

Comment 11N: Connection line and road from Turbine 20 to 21 appears to be within the regulated adjacent area of NYS Freshwater Wetland CT-21. NYSDEC recommends shifting the road to avoid impacts to the adjacent area.

Response 11N: The current Project layout has been revised to avoid placement of turbines and associated infrastructure in wetlands, wetland adjacent areas, and streams where possible. Turbines 20 and 21 have both been eliminated from the current Project layout. As a result, there will be no impacts to NYS Freshwater Wetland CT-21 or its regulated adjacent area.

Comment 11O: Turbine 44 is located within or too close to NYS Freshwater wetland CT-22. NYSDEC recommends removing the turbine or shifting it to avoid impacts to the wetland.

Response 11O: Wetland CT-22 will not be impacted by construction. All construction will occur in the adjacent agricultural field. Erosion and sediment control measures will be implemented to avoid any indirect impacts to this wetland.

Comment 11P: Connection line between Turbine 45 and 49 involves a stream crossing. NYSDEC recommends directionally drilling under the stream.

Response 11P: To reduce wetland impacts, Turbine 45 has been eliminated from the FEIS Project layout. However, the buried interconnect line still runs north from Turbine 49, and still involves a stream crossing en route to turbine 46. This crossing has been identified as a likely candidate for an HDD bore site. The final crossing technique to be used at this location will be determined during the wetland permitting process.

Comment 11Q: Turbine 56 appears to have a direct impact on the nearby stream. NYSDEC recommends moving it to the east to avoid impacts to the water resources.

Response 11Q: Turbine 56 has been moved approximately 50 feet from the nearby stream boundary, so as to reduce potential impacts to the NYSDEC Class C stream and an associated delineated wetland. No impact to the stream is anticipated, and no permanent loss of wetland will occur in this area. Temporarily impacted wetlands in this area will be restored to their original grade, and allowed to regenerate naturally following construction.

Comment 11R: No listing of the three protected streams within the Project boundaries. The classified streams within the Project boundary are ONT-19-39-2-3, Unnamed Water is a Class C(t); ONT-19-39-2, Unnamed Water is a Class C(t); and ONT-19-31-10, Unnamed Water is a Class A. The first two listed waters flow directly into a C(ts) water.

Response 11R: One class A NYSDEC protected stream, an unnamed tributary of Deer River, is located at the south end of the Project Area. In addition, two class C(t) NYSDEC protected streams occur within the Project Area; Boynton Creek, and an unnamed tributary to Boynton Creek which are located in the western portion of the Project Area along the transmission line.

Comment 11S: Changing the wetland type will be considered a permanent impact to the wetland and will require mitigation. Thus, clearing of trees will be a permanent impact to forested wetland areas - to include adjacent areas.

Response 11S: See Section 2.2.2.2 of the FEIS for more information about anticipated impacts to wetlands and streams, including the conversation of forested wetlands to other community types. As indicated in Section 3.2.3 of the DEIS, any required compensatory mitigation will be developed in consultation with the NYSDEC and USACE, and will address conversion of forested wetlands to other vegetative community types.

Comment 11T: If blasting is necessary, NYSDEC must be in the communication chain of the submitted blasting plan.

Response 11T: If blasting is required, the Project Sponsor will provide the NYSDEC with a draft blasting plan for review, prior to finalizing the plan and submitting it to the Town of Denmark.

Comment 11U: Include insects such as the Emerald Ash Borer or any other known occurrences in the area, to the list of invasive species on pages 2 and 3 of the Invasive Species Control Plan (Appendix I). Any firewood material is not to be moved more than 50 miles from the location where they were cut.

Response 11U: The Applicant and its contractors will comply with New York State regulations restricting the movement of firewood. In accordance with 6 NYCRR §192.5, no untreated wood cut as a result of Project construction activities will be moved further than 50 miles. The Environmental Monitor will provide information to contractors about target invasive species during pre-construction training sessions. Information about emerald ash borer will be included in these sessions, and discovery of any insects thought to be emerald ash borers will be reported to NYSDEC.

Comment 11V: Page 3 of the Invasive Species Control Plan, under Construction Materials Inspection, should include the need to inspect the imported wind turbines towers, blades, or nacelles for foreign insects or spiders.

Response 11V: The Invasive Species Control Plan (ISCP) focuses on invasive plant species (see Appendix E). This approach is consistent with that taken in previous ISCPs reviewed and approved by the NYSDEC for other wind energy facilities across New York State (including the Hounsfield/Galloo Island Wind Farm, where NYSDEC was Lead Agency). The focus on invasive plants is due to the nature and scope of the construction activities, which will result in the disturbance of approximately 550.5 acres within the Project area. These areas will be especially vulnerable to the introduction of invasive species, because populations of invasive plants typically establish most readily in exposed soils (e.g., places where the ground has been disturbed during construction).

Most invasive insects arrive via wooden shipping containers or imported live plants, neither of which are proposed for delivery at the Project area. Nevertheless, any suspicious observations of possible emerald ash borer, Asian long-horned beetle, or other foreign insects or spiders will be reported to the NYSDEC.

Comment 11W: The final SWPPP must provide design specifications for water quality and quantity controls that conform to the New York State Stormwater Management Design Manual. The Design Manual is currently undergoing revision, so it is the responsibility of the Applicant to ensure that the SWPPP is developed in accordance with the most recent version. Any deviations from the Design Manual will be subject to a 60 day review and approval process by the Division of Water at the time of construction.

Response 11W: A SWPPP will be prepared for the Project once final engineering is complete. It is anticipated that the vast majority, if not all, of the recommended measures will conform to designs included in the New York State Stormwater Management Design Manual. All necessary review and approval of the SWPPP will be obtained before the initiation of construction.

Comment 11X: The DEIS states that "Given the relatively small area of lost of converted natural communities, the cumulative habitat loss/conversion resulting from the Project development is not considered significant." What is this statement based on and how was it determined that 58.1 acres of habitat, plus 192.5 acres of forest loss would not be a significant impact on the wildlife that uses those habitats?

Response 11X: Please note that the expected impact acreages have changed since the release of the DEIS due to changes in the Project layout (e.g., the elimination of 15 turbines and associated infrastructure). See FEIS Section 2.2.3.2.1 for the updated impacts to vegetation by Project component and ecological community. The statement that the habitat loss/conversion resulting from Project development is not anticipated to be significant is based on the fact that the impacts are so small when considered on a landscape scale. The Project area consists of 9,200 acres, of which 2,885 acres is currently forested. A total of 45 acres will be converted to built facilities (0.5% of the Project area), including 9.9 acres of forest (0.3% of the forested Project area). Furthermore, no unique or unusual habitats will be impacted by Project construction, and the Project area is surrounded by thousands of acres of similar habitats in every direction.

Comment 11Y: The DEIS mentions that the Project could impact forest interior nesting birds, but provides no possible ramifications of such and impact, or potential mitigation options.

Response 11Y: To the extent practicable, the proposed Project utilizes existing farm lanes and logging roads to minimize forest clearing and fragmentation of forest habitat. Project components are generally located along the edges of open areas and active agricultural fields to minimize impacts to forestland habitats. However, in some locations impacts to contiguous forestland will occur. This has the potential to impact forest nesting songbirds by altering their habitat and making the area more attractive to edge-nesting species. It also increases the likelihood that these areas will be used by brown headed cow birds which impact forest nesting species through egg parasitism. As described in FEIS Section 2.1, a number of changes have been made to the Project layout since release of the DEIS, in part to reduce impacts to forested areas. As result, the anticipated temporary and permanent impacts to forested communities are significantly lower than had been predicted in the DEIS (see FEIS Table 2). See also FEIS Section 2.2.3.2.1, which provides additional analysis of forest fragmentation impacts. As indicated in FEIS Section 2.2.3.3, the Project Sponsor is planning to mitigate for tree clearing impacts by planting trees or other similar measures. Specific details of this compensatory mitigation will be developed in consultation with the USFWS and NYSDEC.

Comment 11Z: The statement, "Many of the proposed turbines are sited in active agricultural fields that are already subject to periodic disturbance and have limited habitat value. Therefore, there is a low risk of substantial displacement of breeding grassland birds" is misleading. Current land

uses such as pesticide/herbicide spraying and mowing during the breeding season does not lessen the impacts turbines located in grassland habitat may have on birds.

Response 11Z: The statement quoted in this comment does not indicate that turbines will not have impacts on grassland birds. It simply indicates that active agricultural fields, because they are subject to periodic disturbance and/or may be planted in crops that do not represent appropriate habitat, are likely to account for limited successful nesting by grassland species. Therefore, any displacement affect the turbines might have would potentially affect only a limited number of nesting grassland birds.

Comment 11AA: The DEIS cites results of some post-construction studies conducted in New York between 2008-2011 to support the statement that "raptor migration is typically diffuse in the region" and that "evidence to date shows that risk to migrating raptors is not great and not likely to be biologically significant." NYSDEC would like to point out that the dates these raptors were found were largely during the breeding season, not spring or fall migration.

Response 11AA: The section of text referenced in this Comment has been revised for clarity; see Section 2.2.3.2.2 of the FEIS. Also note that the Kerns and Kerlinger (2004) study, which is cited in the discussion of raptor migration at sites with concentrated hawk migration, focused specifically on the migratory periods, with 26 days of surveys conducted in the spring, two days in the summer, and 33 days in the fall. Migration surveys conducted at the proposed Copenhagen site indicate low migration passage rates for raptors. This is attributable to the fact that there are not any known hawk migration concentrations in the vicinity of the Project area (Kerlinger, 2002; Goodrich & Smith, 2008). Consequently, it is unlikely that more than a few dozen migrating raptors pass through the Project area each season.

Comment 11BB: The range of bat fatalities stated is incorrect. The correct range of bat fatalities in New York, based on studies conducted between 2006 and 2012, is between 0.5 and 40 bats per turbine (0.46 and 26.7 bats per MW).

Response 11BB: The commenter is partially correct, in that the summary of fatality rates in Section 3.3.2.2.2 of the DEIS listed the incorrect upper bat fatality rate (24.53 bats per turbine per study period at Maple Ridge instead of 40 bats per turbine per study period at Cohocton). The correct value of 40 bats/turbine/period was included in Table 10. However, the 2009 mortality rate per MW

per period in Table 10 was incorrect for Cohocton, and should be 26.7 bats/MW/period (Stantec, 2011a), as indicated in Comment 11BB. These mistakes have been listed in the Corrections to the DEIS (Section 3.0 of the FEIS), and the corrected mortality rates have been used in the updated bat fatality approximation discussion (Section 2.2.3.2.2 of the FEIS). However, review of the 2008 Munnsville post-construction monitoring study indicated that the values reported in the DEIS (0.7 bats/turbine/period and 0.46 bats/MW/period) are correct based on the publicly available January 2009 version of the report (Stantec, 2009). Therefore, 0.7 bats/turbine/period has been retained in the FEIS as the lower bound for the range of bat mortality rates observed in New York State.

Comment 11CC: NYSDEC does not consider building a wind energy project to be mitigation for not building an energy generation facility that uses coal, gas, or some other fuel type, as power is still generated from the other sources of energy after a wind project becomes operational. NYSDEC does not agree with the statement that "because wind powered electricity offsets electricity generated by fossil-fueled power plants, implementation of the Project can be considered mitigation for the impacts caused by coal, oil, etc."

Response 11CC: Comment noted. It is acknowledged that NYSDEC disagrees with the quoted statement, and that electricity will still be generated from other sources of energy after the proposed Project becomes operational. However, this statement was not intended to be controversial. It simply refers to the fact that Project operation will reduce greenhouse gas emissions, which are widely accepted to be an adverse impact of fossil fuel combustion (e.g., NYSDEC, 2013). The Project will reduce greenhouse gas emissions by reducing the amount of electricity generated by fossil fuel. According to a 2008 U.S. Department of Energy report, “Wind energy is a preferred power source on an economic basis, because the operating costs to run the turbines are very low and there are no fuel costs. Thus, when the wind turbines produce power, this power source will displace generation at fossil fueled plants, which have higher operating and fuel costs.” On a long-term basis, wind generated power also reduces the need to construct and operate new fossil fueled power plants (Jacobsen & High, 2008).

NYSDEC acknowledges risks associated with the combustion of fossil fuels. For example, on their acid rain website, NYSDEC (2013a) states, “in the early 1970's, acid deposition was identified as a serious ecological threat to New York State's waters and forests. The primary emissions responsible for acid deposition are sulfur dioxide (SO2) and oxides of nitrogen

(NOx) from the combustion of fossil fuels which are transformed and transported downwind before they are deposited." NYSDEC also acknowledges that wind energy facilities can reduce emissions of sulfur dioxide and nitrogen oxides: "Wind is a powerful and plentiful resource that can provide energy without burning fossil fuel or emitting greenhouse gases" (NYSDEC, 2013b) For example, in the Findings Statement for the Hounsfield Wind Farm, NYSDEC (2010) found that, "If the project were not built, the State would lose the opportunity for adding a significant source of clean, renewable energy to New York's energy mix that would lessen the State's dependence on imported fossil fuels. There would also be a lost opportunity to reduce the emissions of greenhouse gases, SO2 and NOx."

Please note that the quoted statement was not made in place of Project- and site-specific mitigation measures, which were described in Section 3.3.3.2 of the DEIS. See also FEIS Section 2.2.3.3, which includes discussion of several additional mitigation measures now proposed for implementation at the Project. In addition, the Project Sponsor is now committing to engage with USFWS through an HCP to further define the various mitigation options for potential impacts to federally-endangered bats. See Response to Comment 10EE.

Comment 11DD: A work plan describing details of post-construction monitoring should be submitted to NYSDEC and USFWS for review, and a final plan in place prior to the start of project operation.

Response 11DD: The Applicant made this commitment in DEIS Section 3.3.3.2,

> *"the NYSDEC is requesting post-construction fatality monitoring studies at all wind power projects in New York State, and the Project Sponsor has volunteered to participate in this program in order to further the State's understanding of bird/bat interactions with wind turbines. This study is anticipated to follow the protocols outlined in the NYSDEC's 2009 Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects. Specifics of the study will be developed in consultation with state and federal agencies, including details such as study duration, search frequency, search areas, number and location of turbines to be searched, concurrent data collection and analysis, carcass collection for further study, and mitigation strategies that may be implemented if post-construction monitoring reveals operational impacts in excess of that which is anticipated or otherwise considered significant. In addition, a work plan for a post-construction*

habitat displacement study will be submitted to the NYSDEC for review prior to Project implementation."

Comment 11EE: Page 84: The mammal species list should also include bear, fisher, otter, squirrels, etc.

Response 11EE: Section 3.3.1.2.2 indicated that approximately 40 mammal species could occur in the Project area, and listed some (but not all) of those species. The commenter is correct. Bear fisher, otter, and squirrels also likely inhabit the Project area.

Comment 11FF: Pages 85-86: Monitors placed at a location 198' and 3.3' above the ground for 168 days recorded 281 calls, but monitors used in conjunction with mist netting collected 995 files in 267.5 hours or 3.7 call/hr. Can the discrepancy between the detection rates be explained?

Response 11FF: Long term fixed monitoring versus monitoring in association with netting are very different survey efforts and thus have distinct methods and goals. The single location survey is a long-term passive acoustic study. At that location two detectors were placed at an existing meteorological tower, one elevated in the air and one at ground level per the NYSDEC protocol. This survey is intended to monitor migrant bats, specifically those found at the height of the rotor sweep zone. The tower was located in the middle of a large agricultural field and while some bats may have been detected at the lower detector this is not ideal habitat for acoustic sampling and results should not be compared to the mist net study. The detectors used in conjunction with mist netting were intended to determine what species might have been present in the vicinity that were not successfully captured by mist net. These sites were specially targeting the capture of bats and detectors were placed in ideal habitats for acoustic sampling, yielding many more calls per hour.

Comment 11GG: Page 87: Myotid calls were unidentifiable. May these have been Indiana bat calls?

Response 11GG: At this time, calls made by different *Myotis* species cannot be distinguished by acoustic analysis with absolute certainty. The text on page 87 of the DEIS clearly indicates that the unknown myotid calls may have been Indiana bat calls:

"A total of 13 myotid calls were recorded at four different sites that could not be identified to the species level. Although neither species were captured in the nets at those sites, based on acoustic characteristics, the unknown myotid calls were tentatively identified as

either little brown bat or Indiana bat (Sanders, 2013b). Since their calls are so difficult to distinguish from those of other more common myotids, acoustic surveys cannot rule out the possible presence of either Indiana bat or eastern small-footed bats."

Since the DEIS was released, a second consulting company, WEST Inc., re-analyzed those calls initially identified as *Myotis* by Sonobat software, searching specifically for evidence of Indiana bat calls. The calls were re-run in three different programs (BCID, Kaleidoscope, and Echoclass) and visually examined by WEST acoustic specialists. WEST concluded that there is insufficient acoustic evidence to indicate the presence of the Indiana bat at this site.

Comment 11HH: Page 88: Successional old field/wet meadows, state that they are small and don't provide preferred nesting and foraging habitat, but then goes on to state that species were found to be breeding there in 2012. Would this not indicate the area is thus suitable at least?

Response 11HH: These grass/forb dominated areas occur primarily on reverting agricultural fields and in wetlands, as well as along roadsides and electrical right-of-ways. Some of these areas provide nesting and foraging habitat for grassland bird species such as bobolink, horned lark, eastern meadowlark, savannah sparrow, and song sparrow, as documented by the on-site breeding bird survey conducted in the Project area (Sanders, 2012a). The vegetation in these fields provides forage in the form of seeds and foliage, which is utilized by a wide variety of birds, as well as small mammals (mice, screws, etc.), whitetail deer, and eastern cottontail. Birds of prey, such as northern harrier and red-tailed hawk, and mammalian predators, such as red fox and eastern coyote, also use such habitats as hunting areas. However, as indicated in Section 3.3.1.2.5 of the DEIS and illustrated in DEIS Figure 6, most of the patches of successional old field habitat in the Project area are relatively small. Many grassland birds are area-sensitive, occurring in higher frequencies and densities in larger grasslands, and avoiding edges near woody vegetation (Ribic et al., 2009; Johnson & Igl, 2001; Vickery et al., 1994). This suggests that although grassland birds have been documented using the small habitat patches within the Project area, habitat is marginal for some species and breeding numbers are likely to be small.

Comment 11II: Page 97: With respect to "adverse impacts on bat populations", restricting tree clearing to winter months would be preferable even in the absence of Indiana bat confirmation.

Response 11II: See Response to Comment 10CC.

Comment 11JJ: Page 98: The DEIS states, "None of the construction-related impacts… will be significant enough to affect local populations of any resident or migratory wildlife species." However, this can't be said definitively, but it can be said that impacts are not anticipated to be significant enough to impact "local populations of any resident or migratory wildlife species."

Response 11JJ: Comment noted. It is acknowledged that this statement is unsubstantiated as written, as the impacts cannot be predicted with absolute certainty. The sentence has been revised for inclusion in the FEIS to indicate that "construction-related impacts resulting from the proposed Project are not anticipated to be substantive enough to significantly affect local populations of any resident or migratory wildlife species."

Comment 11KK: Page 99: Please clarify the following, "Wind, 3 to 4 avian fatalities/gigawatt-hr, fossil fuel 5.2/gigawatt-hour, brief" in terms of how it was derived. Also, the DEC disagrees with the statement that agricultural lands have limited wildlife value. This statement should be reworded or eliminated.

Response 11KK: The statement quoted needs to be read in its entirety and in context. As stated on Page 99 of the DEIS "with respect to avian impacts, a recent peer reviewed article presented a contextual assessment of avian mortality caused by various sources of electricity generation. Initial estimates suggest that wind farms and nuclear power stations are responsible each for between 0.3 and 0.4 avian fatalities per gigawatt hour (GWH) electricity, while fossil fuel powered stations are responsible for approximately 5.2 avian fatalities per GWH (Sovacool, 2009)". As indicated above, the source of this information is cited, and can be reviewed by the commenter if additional information on its derivation is required. In terms of the limited habitat value of active agricultural land, please see response to Comment 11Z.

Comment 11LL: Page 100: Losing forest, conversion to successional community is viewed as a loss, but not a significant loss. Depending on the species being considered, this could be a gain.

Response 11LL: Comment noted. The discussion of forest fragmentation on page 100 of the DEIS acknowledges that conversion to successional communities may be beneficial for some species, "Other avian species that are considered early successional specialists (e.g., indigo

bunting, mourning warbler, eastern towhee) may benefit from forest fragmentation and the creation of additional edge habitat."

Comment 11MM: Page 101: Was the Kerlinger & Guarnaccia 2010 study also conducted in NY? "Any impacts to grassland-nesting species are anticipated to be much less than the impacts from existing hay mowing and pesticide use in the same area." As there is no citation, this statement seems to be pure conjecture. Also, "Forest and forest edge birds are not likely to be significantly disturbed because these species are familiar with tall features (i.e., trees) in their habitat. This is cited, but was it peer reviewed?

Response 11MM: As indicated in the DEIS, the 2010 Kerlinger & Guarnaccia study was conducted at the Noble Wethersfield Windpark in Wyoming County, New York. The quoted statement regarding impacts to grassland birds, as well as the one regarding forest and forest edge birds, are both from Kerlinger & Guarnaccia, 2007. This study was a Phase 1 Avian Risk Assessment that was prepared for the Roaring Brook Wind Power Project in Lewis County. It was not a peer reviewed publication but includes numerous citations to peer reviewed articles and papers.

Comment 11NN: Page 102: With respect to waterbirds, "no significant, long term displacement or mortality is expected". A sweeping statement such as this seems worth of more than one 8 year old citation.

Response 11NN: The commenter has not provided any citations that refute this statement, and we are unaware of any significant waterfowl mortality documented at an operating wind power project. Additional studies are available showing an apparent lack of significant collision mortality of waterfowl at wind energy facilities. For example, a recent study published in the Journal of Wildlife Management examined mortality of female ducks near wind turbine facilities in the Prairie Pothole Region, the most productive breeding habitat for North American ducks. The effects of wind energy on breeding female mallard (*Anas platyrhynchos*) and blue-winged teal (*A. discors*) survival was assessed by monitoring 165 radio-marked ducks (77 mallards and 88 blue-winged teal) during the 2009 and 2010 breeding seasons at the Tatanka Wind Farm near Kulm, North Dakota. During the same period, 145 female ducks (70 mallards and 75 blue-winged teal) were monitored at an adjacent reference site without wind turbines. Collision mortalities were rare: only 1 radio-marked female mallard and no blue-winged teal collided with wind turbines. The study concluded that the limited number of collisions observed for

monitored mallards and blue-winged teal nesting at the Tatanka Wind Farm suggests that wind turbines had no direct effect on female survival (Gue et al, 2013).

Comment 11OO: Page 102: With respect to raptors, "May experience displacement, decrease in density within the Project area after construction, but will most likely acclimate to the turbines with time.". What does this mean and what is it based on?

Response 11OO: As indicated by the full text of the sentence excerpted in Comment 11OO, this is based on a study from the Midwest (Garvin et al., 2011), which compared the abundance and behavior of raptors at a wind energy facility. The study found that the number of raptors declined by 47% when post-construction levels were compared to pre-construction levels, and that some raptors tend to exhibit avoidance behavior by remaining at least 100 meters from the turbines and above the height of the rotor swept zone. The degree of behavioral response to the turbines was dependent on the species, with turkey vultures and red-tailed hawks exhibiting high risk flight behaviors more than other species. The study concluded that the "observed and estimated avoidance rates, coupled with low mortality events, may indicate effective avoidance behaviours by individuals that remain within the windfarm project area. Determining whether resident species will habituate to the presence of the windfarm and return to their pre-construction levels will require additional years of study" (Garvin et al., 2011).

Comment 11PP: Page 108: Final paragraph on this page states, "no hibernacula in area". However, the Project is within approximately 20 km of a hibernacula and 12 km of a foraging area.

Response 11PP: The statement quoted in this comment is included in the following sentences in the DEIS "bat fatalities that the project are anticipated to be similar to those documented elsewhere in New York State. This prediction is based on the results of the habitat surveys, acoustical monitoring studies, and literature review which did not identify any elevated indicators of risk to bats at the Copenhagen Wind Farm site (e.g., there is no evidence of large roost, hibernacula or elevated bat activity in the area)." In this context it is clear that "in the area" refers to the area on and adjacent to the participating parcels. Distances of 20 km and 12 km are not considered to be in the area of the proposed Copenhagen Wind Farm.

Comment 11QQ: Page 111: DEIS states "Habitat within the Project area not suitable for breeding bald eagles." DEC and USFWS would consider eagle impacts within a 10 mile buffer of the Project footprint. There are two nests in proximity to the Project which may be close to the 10 mile buffer. Clarification is necessary. There are other sites in the Project area which could also be potentially expected to support bald eagles.

Response 11QQ: See Response to Comment 10KK.

Comment 11RR: Page 112: The second paragraph states that hibernacula is approximately 25 miles away but is actually 20 km from site. Moreover, saying that the risk to the species is low based on their rarity in NY is counterintuitive and misleading.

Response 11RR: The FEIS has been corrected to reflect the fact that the Glen Park hibernaculum is approximately 22 kilometers (13.7 miles) from the nearest proposed turbine. The statement regarding risk and rarity is meant to indicate that the low number of individuals within the Indiana bat population (and other factors) suggest that relatively few bats of this species would occur in the Project area and thus be exposed to the risk of turbine collision. This is indicated fairly clearly in the concluding sentence of this paragraph regarding the effects of night white-nose syndrome, which states “with decreases to already small populations, there is even less likelihood of these species being at the Project area, and thus exposed to collision risk”.

Comment 11SS: Page 115: Fourth paragraph, NYSDEC would not consider implementation of this Project in itself to be considered mitigation.

Response 11SS: See Response to Comment 11CC.

Comment 11TT: Page 116: First paragraph, should read "no mitigation is proposed". NYSDEC may require mitigation based on analysis of the final application for construction.

Response 11TT: See FEIS Section 2.2.3.3, which includes discussion of several mitigation measures now proposed for implementation at the Project.

Comment 11UU: Though immediate cumulative impacts to habitats greater than 10 miles away from the Project may be limited to local fragmentation, potential impacts on the wildlife utilizing these habitats

across a greater distance is possible, particularly to bats and wide-ranging birds. Projects proposed in Jefferson County should also be considered in the cumulative impact analysis for bats and birds. Though mortality rates at the proposed Copenhagen project may be expected to be similar to Maple Ridge and other operating projects in New York, the potential for impacting Indiana bats is greater in Jefferson County, and potentially also at Copenhagen than in most other areas of the state.

Response 11UU: See response to Comment 10UU regarding cumulative collision mortality impact analysis. It should also be noted that the bat studies conducted for the Copenhagen Wind Farm project do not indicate a high likelihood of Indiana bat occurring within the Project area, nor do they suggest an elevated risk of impact to this species. However, the Applicant has agreed to seek an Incidental Take Permit for both the Indiana and northern long-eared bats.

Comment 11VV: Three other sites are referenced to compare raptor passage rates, but the report does not disclose which sites were used. The names, locations, and raptor passage rates for these sites should be included in the report.

Response 11VV: Section 5.0 of the Raptor Migration Observation report compared passage rates observed in the Project area to three other sites with publically available data in the region. These sites consisted of Clayton, St. Lawrence, and Cape Vincent, all in Jefferson County (no raptor migration data is publically available for Lewis County). Passage rates at Clayton averaged 9.1 birds/hour in the fall and 12.1 birds/hour in the spring. Passage rates at St. Lawrence averaged 9.6 birds/hour in the fall and 11.5 birds/hour in the spring. Passage rates at Cape Vincent averaged 5.5 birds/hour in the fall and 8.2 birds/hour in the spring.

Comment 11WW: In Section 1, two different locations were used for spring and fall surveys. Is there a reason that the same location was not used for both survey periods? Or that more than one location was not surveyed during each survey period?

Response 11WW: The same location was not used during both surveys due to seasonal land use restrictions. The landowner of the first location did not want surveys on his property during the fall hunting seasons; therefore a second location was selected. The NYSDEC was notified of the change in the study plan distributed in August of 2012 before sampling commenced. Only one location was requires for the Project, as it was sufficient to survey for migrant raptors based on

the Project layout. This level of effort was agreed to in consultation with the NYSDEC at a February 2012 Project meeting, where NYSDEC indicated expectations of low migration numbers due to the Project location.

Comment 11XX: It is doubtful that it was really possible to discern migrating and local birds from one another, given the criteria used and the distance many were viewed from. This issue should be addressed.

Response 11XX: Methods for distinguishing migrant from local birds are based on those described by the Hawk Migration Association of North America (HMANA), which state that, though discerning the difference between migrants and locals is often difficult, each site should define what constitutes a migrant versus a local raptor. These terms were defined as follows for use on the Copenhagen site:

- *Migrant (spring):* Raptors traveling through the proposed wind farm site in the general directions of WNW, NW, N, ENE, or NE were considered migrants.
- *Migrant (fall):* Raptors traveling through the proposed wind farm site in the general directions of WSW, SW, S, ESE, or SE were considered migrants.
- *Local:* The term "local" is generally applied to non-migrating birds. Raptors exhibiting the local behaviors such as flying north in the fall or south in the spring, or prolonged hunting behavior without exiting the proposed wind farm site, were counted as locals. Local observations include but are not limited to: residents, local dispersing raptors, and migrating raptors stopping over to hunt.

These definitions, and their use on this Project, are fairly standard HMANA protocol.

Comment 11YY: In Section 4.10 flight height, given that the height categories seem random, were they just "made up" for this Project? Wouldn't radar used in conjunction with the visual observations (multiple points used in both spring and fall surveys), have been much more effective?

Response 11YY: The "flight height" category on the Raptor Flight Info Datasheet was generated by Sanders Environmental in order to collect more precise height from the ground data than is normally collected through the HMANA protocol. The purpose of this data was to help determine how high the raptors were flying through the wind farm and to help visualize whether or not they were potentially flying through the intended rotor-swept zone. For additional information, see

response to Comment 11AAA. Per the NYSDEC protocol, radar was not requested nor required for this site. Radar is a very costly survey method which has primarily been used to determine the altitude, passage rate, and flight direction of night-migrating songbirds. It is not typically employed in raptor migration studies, and provides very little useful data beyond that which can be obtained through visual observation.

Comment 11ZZ: Raptor Daily Report Forms: it seems hard to believe that for days on end one could observe the sky in any location for up to 580 minutes/day and not see raptors of any description. How is this explained?

Response 11ZZ: Per discussions at the February Project meeting with NYSDEC, very few raptor observations were expected. The location for this Project is not in the vicinity of any "leading lines", such as coast lines or mountain chains (examples include Lake Ontario and the Appalachian Mountains) that would tend to concentrate raptor migration (Goodrich & Smith, 2008). The lack of these features at this site serves to explain the low numbers of raptors observed.

Comment 11AAA: The report sheets refer to heights as 1, 2, 3, or 4, or does this correspond to L, M, H, VH?

Response 11AAA: No. Two different height code systems were used. On the HMANA form (which addresses only migrants), the HMANA national standard system of 1,2,3,4… was used. Since the HMANA system does not estimate height over 30 meters, the Sanders Datasheet (which includes both migrant and local birds) employs the more specific L, M, H, and VH height codes. Definitions of the Sanders and HMANA codes are as follows:

<u>Sanders Flight Height Codes:</u>

L: Eye level or below

M: Above eye level to three times the height of local trees

H: Three times height of local trees to limit of unaided vision

VH: Beyond limit of unaided vision, within limit of binocular aided vision

<u>HMANA Height of Flight Codes:</u>

0 – Below eye level

1 – Eye level to about 30 meters

2 – Birds seen easily with unaided eye (eyeglasses not counted as aids)

3 – At limit of unaided vision

4 – Beyond limit of unaided vision but visible with binoculars up to 10x

5 – At limit of binoculars

6 – Beyond limit of binoculars 10x or less, but detectable with telescope or binoculars of greater power (note magnification)

7 – No predominant height

These numerical values describe the location of the raptor flight in relation to the observer's location, not necessarily in a strictly vertical sense. The following description of this variable is taken directly from the HMANA (2006) protocol. "The estimation of height of flight is a function of the location of the monitoring site, in which case an accurate description of the monitoring site is important. For example, a site located in a mountain ridge may likely have birds above or below the horizontal."

Comment 11BBB: If the harriers were determined to be local, it seems odd that they were not seen more regularly when surveys were conducted daily for 7 1/2 months.

Response 11BBB: The classification of a raptor as "local" does not mean that the individual raptor noted as "local" always lives in the area observed. The word "local" should not be confused with "resident." During migration, raptors must use areas that they migrate through for hunting, and food availability generally drives the continuance of migration. Raptors often make brief or even prolonged stop-overs on their migrations when they find an ideal situation to suit their hunting needs. The habitat within the vicinity of the hawk watch was appealing to northern harriers for hunting. Therefore, it drew in migrant northern harriers. However, as described in Sanders (2013a) report, any raptor observed hunting and not exiting the site was recorded as local. A few northern harrier individuals were observed in the vicinity of the Project area during surveys but were never encountered within the Project boundaries. Therefore, these birds were not counted as incidentals. Some of these observations occurred outside of the migration season.

Comment 11CCC: It doesn't seem possible to determine if an immature bald eagle is local or migratory with any confidence, based on a single observation.

Response 11CCC: Refer to Response 11XX.

Comment 11DDD: The sound from wind turbines is variable and periodic thus can be more annoying to the public than a continuous noise of the same average amplitude. The characteristic of the sound generated is important in considering its impact on the public. As wind turbine generator noise is characterized by amplitude modulation (whooshing, for example), this should be considered in the analysis as some studies have shown amplitude modulation as an annoyance factor for the public. The sound from the mechanics of wind turbine may also be considered potentially "tonal". Sound of this nature is also noted as also being of a more irritating quality at a given sound decibel level. Thus, the annoyance generated may be greater than that indicated by simple comparison of sound decibel level and it may be advisable to add a calculated number of dBA to the generated sound in an attempt to compensate for this characteristic.

Response 11DDD: A revised sound assessment was performed for the FEIS Project layout. The results of this analysis are presented in Section 2.2.7 and Appendix J of this FEIS. This sound assessment, and the original study included as DEIS Appendix M, were prepared according to the methodology described in the NYSDEC's 2001 Program Policy *Assessing and Mitigating Noise Impacts*. While potential sound character issues, such as amplitude modulation and tones, might be analytically accounted for by adding a safety factor to the turbine sound power level and increasing the predicted levels, the approach taken in this assessment was to evaluate the predicted mean Project sound levels relative to the actual community reaction observed at similar wind sites, including several in New York State, to those same sound levels. Field tests of numerous operating wind projects indicate that the mean measured level at any given point of interest tends to agree quite closely with model predictions based on the as-measured sound power level derived from field testing per IEC 61400-11 *Wind turbine generator systems – Part 11: Acoustic noise measurement techniques*. Furthermore, a correlation between the measured sound levels at numerous residences throughout comparable wind project sites and the number of complaints at each site shows that complaints are very few at all sound levels below about 45 dBA, about 2% or less (Hessler & Hessler, 2011). A mean sound level of less than 45 dBA is predicted for all residences within the Copenhagen Project area. The fundamental point is that the Project sound emissions at all of these other sites where field tests were conducted were just as likely to experience amplitude modulation or mechanical tones as Copenhagen – yet the overwhelming majority of residents living in close proximity to turbines at those sites (roughly 98% or more) evidently had no significant objections to the sound.

Comment 11EEE: Wind velocity may be nearly double that anticipated at hub height during nighttime stable atmospheric conditions. Thus resultant sound levels might be much higher than anticipated relative to background. Care should be taken to compare likely lower background noise levels at night and consequent possible higher spreads between background and wind turbine generated sound at a time when annoyance may be the greatest. Stable atmospheric conditions at night when the difference between ground level wind and hub height wind speeds may be most pronounced should be modeled to examine noise impacts during periods of atmospheric stability. Nighttime noise is perceived as more irritating and the use of correction factors for such periods is discussed as Ld/n.

Response 11EEE: The field measurements of existing sound levels in the Project area were made on a continuous day and night basis. It is acknowledged that the audibility of wind turbines and their potential for annoyance is greatest at night. Adverse noise impacts during daytime conditions are largely unheard of. Consequently, although measurements were taken both during the day and at night, only the nighttime results were used as a design basis for the assessment. Consideration of residents' reactions at similar operating wind energy facilities is again useful. The 2011 study cited above in Response to Comment 11DDD, which evaluated the actual reaction to specific sound levels through field testing, consisted of monitoring surveys at multiple sites where project sound levels were measured day and night in a variety of wind and weather conditions for a period of 2 to 3 weeks each. This relatively long survey duration was deliberately adopted (vs. relying on short-term spot samples) to capture periods of stable atmospheric conditions, high winds, low winds, etc. Consequently, the correlation between a certain mean project sound level and complaints essentially includes the effects of "unfavorable" atmospheric conditions, such as high wind shear (high winds aloft but nearly calm at the surface). The study showed that at the sound levels proposed by this Project, the overwhelming majority of residents living in close proximity to turbines at similar sites (roughly 98% or more) had no significant objections (Hessler & Hessler, 2011).

The sound emissions from wind turbines do vary with time due to fluctuating wind and atmospheric conditions; field experience measuring operational projects indicates that the normal variation is usually in the +/- 5 dBA range. The model predictions represent the mean sound level, or the far field sound level that is most commonly experienced. Using the peak sound level of the mean plus 5 dBA as a basis for evaluating community reaction would over-emphasize and unfairly characterize the potential impact of a project because such levels are

not a regular occurrence. As an illustration of this, the Maine Department of Environmental Protection sound test procedure for newly operational wind projects (Maine DEP Site Location Law, Chapter 375 Section 8(e)(7) is exclusively focused on measuring worst-case community sound levels during stable atmosphere, high shear conditions. To be a valid result, the measured level at a potentially sensitive receptor must be measured when the test point is downwind of the nearest turbines, when the ground level wind speed is below 6 mph, and when the hub height wind speed is sufficient for the turbines to be operating at their maximum rated power (i.e., the measurement must be made during high shear conditions). Sound levels measured during all other conditions are disregarded. While this may appear to be a conservative and highly protective approach, the practical reality, based on experience reviewing test reports from numerous projects on behalf of the Maine DEP, is that it is extremely difficult to capture sound levels in such conditions and it is a commonplace for field testing to go on for 3 to 4 weeks before the minimum number of valid 10 minute samples are recorded. In fact, it is common for there to be no valid samples, or very few, at typical receptor positions after weeks of testing. Moreover, the sound levels actually captured under the prescribed conditions typically aren't unusually loud or out of compliance with regulatory limits. Consequently, a rigid focus on these unusual atmospheric conditions as a basis for project design and impact assessment is unwarranted.

According to operations personnel at two operating wind projects in New York, sound exceedances are rare events that are often attributable to mechanical problems or blade surface damage. When these problems occur, they are generally addressed quickly as part of routine maintenance and repair. Other conditions that reportedly can result in increased sound propagation include ice build-up on the blades, and unusually high wind speeds (i.e., over 12-15 m/s [27-33 mph]). The Project's sound consultant estimates that the actual sound levels might significantly exceed the predicted mean level roughly 2% of the time.

Comment 11FFF: In Section 3.7.2.2., it is stated that "…it would be incorrect and meaningless to compare the maximum turbine sound level, which requires high winds for it to occur, to the background sound level on a calm, quiet night." The Swedish study ("Human Response to Wind Turbine Noise", Eja Pedersen, Goteborgs Universitet, 2007) may indicate that this scenario may be approaches more closely than commonly thought.

Response 11FFF: The quoted statement refers to the clearly biased practice adopted in the past by certain opposition groups or individuals in order to exaggerate potential differences from background levels of sound. This practice uses the very lowest background level measured over a lengthy survey period (usually occurring during dead calm conditions) as the design background sound level, and compares this extremely low value (often in the low 20's dBA) to the maximum project sound level, which normally requires a hub height wind speed of roughly 9 m/s (20 mph) or higher to occur. While steep wind gradients can intermittently occur, it would be unrealistic and an unfair comparison to consider such a situation the "normal" or predominant wind condition. Studies conducted at various wind energy sites in Maine found these conditions to be extremely rare: either no valid samples or very few were observed over 3 to 4 week survey periods. It is much more common for the background sound level to be considerably higher (in the high 30's dBA), due to wind-generated noise when the turbines are in full operation. A lack of wind at ground level does not automatically imply that the ambient sound level at ground level is negligible. The Pedersen study observes that turbine noise was reported to be more audible by survey respondents and therefore more likely to cause annoyance during lighter wind conditions when the background sound level is only moderate, which is not unexpected. However, it is the radical practice of comparing an extremely low background level to the maximum turbine sound level that is being referred to in the quote.

Comment 11GGG: The sound study provided by the applicant assumes that wind turbine generators will act as a point source in generating sound. However, as turbines are commonly configured in a line, noise may not drop off as quickly as possibly assumed. It is not clear if this consideration is examined.

Response 11GGG: Concerns about sound levels diminishing with distance at a slower rate from a line of turbines, as opposed to a random or irregular distribution, can be traced back to work by Hubbard and Shepherd (1982), in which the sound emissions from a line of very small 50 kW turbines on short lattice towers lined up almost tip to tip were analytically calculated (not measured) to decay at a rate of 3 dB per doubling of distance (rather than the normal 6 dB). The reality is that modern turbines are widely spaced, at intervals of 1000 feet or more, to minimize wake effects. Consequently, even when arranged in a line, they do not form anything like a continuous linear noise source. Treating each unit as an individual point source is the correct modeling approach.

Comment 11HHH: Particularly at night, wind speeds may be relatively uniform and thus a synchronicity in the sound from various turbines may result in an unexpected additive effect from an "in phase" generation of sound from the various turbines. This is particularly the case since turbine blades are at most 60 degrees out of phase.

Response 11HHH: In general, the greater the number of turbines the more “bland” and steady the sound becomes as the periodic nature of the sound from each individual unit is diffused by the random, incoherent sound emissions from multiple nearby units. While the overall magnitude increases, as would be expected and as modeled, the probability of so many units turning in perfect unison and possibly creating the “in phase” effect mentioned in the comment decreases. Realistically speaking, no such effect is anticipated at Copenhagen.

Comment 11III: Error is a component of any study. Some discussion is encouraged to focus on the likely degree of measurement and model error. An analysis should be included in the FEIS to ensure that the results are not in danger of underestimating possible impacts. One possible source of error to discuss is the fact that sampling represented only several days and this may not represent atmospheric conditions common over the course of a year. Two other sources of error to consider are the degree of uncertainty in the manufacturers' estimate of sound power for their wind generators and the error associated with following the ISO 9613-2 modeling protocol.

Response 11III: The modeling associated with far field sound levels from wind turbines is representative of the predicted sound levels based on the input of a number of variables. However, the predicative nature of the model varies because of the irregular nature of the wind flow into the turbine rotors, its effect on noise generation at the source, and the propagation of noise from the source to the receiver. Evidence based on noise modeling experience at wind farms around the world shows that comparisons between model predictions using ISO 9613-2 and the actual project-only sound levels measured at distant receptors over time are good, indicating that the modeling is reliable and generally accepted as predicative of potential Project noise levels. The key phrase here is “over time.” The observed agreement is between the mean measured level over an extended period and the model prediction. In the short-term the Project sound level will vary as stated in Section 3.5 of the noise assessment report (DEIS Appendix M):

> *“Because they are entirely dependent on constantly changing wind and atmospheric conditions, wind turbine sound emissions are highly variable with time and will routinely*

fluctuate above and below the predicted mean level, usually within +/- 5 dBA, but by greater amounts on occasion."

The community reaction, expressed in terms of complaints at specific sound levels in Hessler and Hessler (2011), is correlated to this mean measured sound level and, by extension, to the modeled sound level. With regard to the degree of uncertainty associated with the manufacturer's estimate of sound power, GE provides sound pressure levels that are accurate to +/- 2 dBA. However, the field tested sound power level of installed units essentially agrees with the stated mean performance, even in cases where abnormally high sound levels are suspected from a particular turbine. Therefore, if explicit margins of 2-3 dBA were added to the model predictions to account for the for uncertainty in the input sound power level and the ISO 9613-2 methodology, the predicted result would be high by the amount of those margins, suggesting a greater potential noise impact than is likely to actually occur.

Comment 11JJJ: The Applicant needs to complete any outstanding requests for cultural resource survey work that has been requested by OPRHP/Division for Historic Preservation so that our agency can appropriately assess potential impacts to historic/cultural/archaeological resources. The Applicant needs to contact OPRHP directly and work closely with them to ensure protection of cultural resources.

Response 11JJJ: As described in Section 2.2.6 of this FEIS, a Phase 1B Archeological Survey (EDR, 2014b; FEIS Appendix H) and Historic Resources Survey (EDR, 2014c; FEIS Appendix I) were completed for the Project subsequent to the completion of the DEIS. Both of these studies were conducted in accordance with the *New York State Historic Preservation Office Guidelines for Wind Farm Development Cultural Resources Survey Work* (the *SHPO Wind Guidelines;* NYSOPRHP, 2006). Per the *SHPO Wind Guidelines*, work plans that detailed the scope of work for each survey were submitted to NYSOPRHP for review and comment prior to undertaking the surveys. The results and findings of these cultural resources studies are summarized in Section 2.2.6 of this FEIS. Both studies were also submitted to NYSOPRHP for review in January 2014.

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[9] To ensure consistency between documents, the lettering of multiple references from the same author in the same year used in the DEIS have been retained in the FEIS, even where only a subset of such references have been cited.

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